STID 4987

RRSP: 94286-03-17

HYDROSOLUTIONS OF CALIFORNIA, INC.

LETTER OF TRANSMITTAL

TO: ALAMEDA Co. HEALTH AGENCY
DEPT. OF ENVIRONMENTAL HEALTH
80 SWAN WY, ROOM 350
OAKLAND, CA 94621
ATT: SUSAN HUGO

DATE: 8-19-94
SUBJECT:
4800 SAN PABLO AVENUE
EMERYVILLE, CA

We are enclosing: X Herewith ___Under Separate Cover

No. of Copies	Description
2	SITE CHARACTERIZATION (RRSP: 94286-03-14)

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Remarks: AFTER REVIEW, PLEASE CONTACT ME.

cc: MARYANN LESHIN
file

By: Stephen J. Sale

AUG 24 RECD

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STID 4987

SITE CHARACTERIZATION
4800 SAN PABLO AVENUE
EMERYVILLE, CALIFORNIA

Prepared for:
City of Emeryville Redevelopment Agency
2200 Powell Street
Emeryville, California 94608

Prepared by:
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Fair Oaks, California 95628-2714

RRSP: 94286-03-14

August 1994

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1.0 INTRODUCTION

A redevelopment project initiated between the City of Emeryville Redevelopment Agency (City) and City of Oakland is currently being examined. A part of this project is the possible acquisition of a property (figure 1) located at 4800 San Pablo Avenue, Emeryville, California (subject property). Pre-acquisition concerns typical of real estate transactions include the evaluation of the subject property for pollution liabilities. Because of this, field investigations have been completed. Previous activities on the site include a gasoline service station, however, no public record documents disclosing completion of any tank closure have been identified.

Previous investigations have been completed at the subject property and include: 1) a soil-gas survey, 2) an aerial photo search and 3) a drilling and sampling program consisting of six borings.

Sanborn maps from 1950 through 1969 appear to illustrate dispenser island locations and an old building. Present building and concrete slab locations are recorded in similar locations as aerial photographs and Sanborn maps. Information obtained from maps and aerial photographs were compared with the current asphalt and concrete patches noted on-site. Concrete patches are illustrated in figure 2 as unnamed rectangles. The three north trending concrete slabs were broken in the center (3-4 foot wide breaks) which may indicate past usage as a dispenser island. An asphalt patch located near WB-14 (figure 3) may represent the location of a previously removed UGST or piping. Soil-gas probes were also noted as easily penetrating the groundsurface near boring, B-5, figure 3. The sand fill in this area suggested that an UGST excavation may exist. All soil-gas samples measured for organic vapors indicated very low concentrations. No gasoline-like odors were noted.

Due to past land usage as a gasoline service station and the location of concrete slabs and asphalt patches on the subject property, HSCI recommended in November 1993 an electromagnetic survey be completed and limited drilling and sampling of sediment with a "geoprobe" sampling device. Evaluation of the possible presence of underground storage tanks and total petroleum hydrocarbons (TPH) contamination were to be investigated.

A geophysical survey was completed on December 22, 1993. The intent for completing this survey was to evaluate the possible presence of an UGST beneath the subject property. Two geophysical tools were utilized for surveying the site; 1) Schonstadt MAC 51-B Magnetic and Cable Locator and 2) Metrotech Model 810 Radio

Frequency Line Tracer. The surveyor concluded that measurements at the subject property did not depict the typical signature of a buried UGST. Large metal objects are suspected in the center area however their appearance is discontinuous. The most significant anomaly was noted near B-3 (figure 2).

Subsequent to the geophysical survey, a limited drilling program was completed with a "geoprobe" tool. Six (6) exploratory borings were completed, borings B-1 through B-6 and are illustrated in figure 2. The basis for choosing each boring location included; 1) anomalies detected during the geophysical survey, 2) material encountered beneath concrete slabs or asphalt patch and 3) location in areas which unusual observations were made during the soil-gas survey (e.g. shallow refusal during drilling, low induced vacuum).

Generally, the geologic profile of the topmost fifteen feet is a silty clay/clay. Boring, B-6, however penetrated a very fine grained sand. Maximum depth of exploration during this phase of drilling was fifteen feet. Groundwater was encountered in boring, B-6, at an 8.5 foot depth, approximately. No groundwater was encountered in B-1 through B-5.

Field measured organic vapors ranged from 0 to 40 ppm and were noted primarily between the five and ten foot depth. Olifactory observations included old petroleum-like and gasoline-like odors.

Soil samples collected from the saturated zone in B-6 contained 63 ug/kg benzene. This concentration is a measure of benzene dissolved in groundwater and absorbed onto the soil matrix. In addition, soil samples from borings B-1 and B-2 contained detectable levels of BTXE at the 8.5 to 10.5 foot depth interval. Two samples of sediment from borings B-1 and B-6 contained 990 mg/kg and 3900 mg/kg TPH by modified EPA Method 418.1.

HydroSolutions of California, Inc. attended a meeting with the City of Emeryville and present owners of the subject property to discuss the conclusions of all investigative actions (February 23, 1994). Both the City and present subject property owner agreed to submit an unauthorized release form to the Alameda County Environmental Health Department and schedule a meeting with the County and Regional Water Quality Control Board. Discussions with the agencies would include conclusions of the drilling and sampling program and future assessment and cleanup

requirements likely to be requested by the regulatory agencies. Alameda County Environmental Health (County) was identified as the lead agency for this situation.

HSCI and the City met with the County and Regional Water Quality Control Board on February 23, 1994. Goals and methodologies approved during this meeting are listed in Section 2.0 (Scope of Work).

A brief site characterization workplan (RRSP:94286-03-10) was submitted to the County on June 3, 1994 to confirm subsequent field investigation to be completed at the subject property. Verbal acceptance of this workplan was provided (telephone correspondence) by Susan Hugo prior to field implementation. This report discusses field and laboratory work completed during this phase of investigation and recommendations for remediation.

2.0 SCOPE OF WORK

This report describes additional assessment for defining the lateral extent of soil contamination and water quality of groundwater. Data has been compiled and copied in appendices A through D.

Specifically, activities have been designed to address the following concerns:

Define the lateral and vertical extent of TPH contaminated sediment;

Evaluate the existence of benzene, toluene, xylene, and ethylbenzene, waste oil and gasoline in sediment located above the groundwater aquifer and its potential to migrate to groundwater;

Evaluate the significance of elevated TPH concentrations detected in the 418.1 analysis (conducted in December 1993) both spatially and its' potential migration to the shallowmost groundwater aquifer;

Define cleanup objectives for soil cleanup;

Estimate cost and conditions (limitations, advantages and disadvantages) for implementing soil cleanup;

Evaluate the existence of benzene, toluene, xylene and ethylbenzene, waste oil and gasoline in the shallowmost groundwater aquifer (i.e. 25 foot depth, approximately);

Evaluate the likelihood for the adjacent creek to act as a source of TPH contamination on the subject property;

Evaluate the likelihood for the sanitary and storm sewers to act as a source of TPH contamination to the subject property;

Estimate cost and conditions (limitations, advantages and disadvantages) for implementing groundwater cleanup, if needed.

3.0 FIELD ACTIVITIES

Recent field activities were initiated in June 1994 and continued into July. Field activities included drilling and sampling of sediment from each boring, construction of five groundwater monitoring wells, surveying of each well head and groundwater sampling.

3.1 Drilling & Soil Sampling

Eight (8) exploratory borings were completed. Drilling depths ranged between 11 and 31 feet and included four groundwater monitor wells penetrating the 30 foot depth and one groundwater monitor well penetrating the perched groundwater condition adjacent boring, B-6.

Boring, WB-7, is located along the western perimeter of the subject property. This boring was used to; 1) define the lateral extent of contamination in soil and groundwater and 2) serve as a groundwater elevation control point. Drilling depth was 31 feet.

Boring, WB-8, is located in the vicinity of boring, B-1 and a dispenser island. The purpose for choosing this boring location was to; 1) evaluate the significance and aerial extent of the heavier, oil range TPH detected at the ten foot depth in B-1, 2) evaluate the likelihood of petroleum leaching to groundwater, 3) evaluate the likelihood of petroleum originating from the sanitary sewer system and 4) serve as a groundwater elevation control point. Drilling depth was 31 feet.

Boring, WB-9, is located adjacent the northern property boundary (adjacent the drainage channel). The purpose of this boring was to; 1) define the extent of contamination along the northern property boundary, 2) evaluate the lateral significance of the heavier hydrocarbons detected by the modified EPA Method 418.1 and 3) serve as a groundwater elevation control point. Drilling depth was 31 feet.

Boring, B-10, is located in the northwest corner of the subject property. The purpose of this boring was to define the extent of contamination. Drilling depth was 26 feet.

Boring, B-11, is located in the southwest corner of the subject property. The purpose of this boring was to define the extent of contamination. Drilling depth was 26 feet.

Boring, WB-12, is located in the southeast corner of the subject property. The purpose of this boring was to; 1) define the extent of contamination along the eastern property boundary, 2) lateral significance of the heavier hydrocarbons detected by the modified EPA Method 418.1 and 3) serve as a groundwater elevation control point. Drilling depth was 31 feet.

Boring, B-13, is located along the south side of 48th Street, due south of boring, B-4. The purpose of this boring was to define the extent of soil contamination along the southern boundary of the contaminant plume. Drilling depth was 26 feet.

Lastly, boring, WB-14, is located immediately adjacent B-6. The purpose of this boring was to collect a groundwater sample from the perched groundwater identified during the drilling of B-6. Drilling depth was 11 feet.

Generally, one sample was collected at each five foot interval. Samples were placed in brass tubes, wrapped on the ends with aluminum foil, capped with PVC caps, taped, and labeled. All samples were stored at reduced temperature in an ice chest and delivered to the laboratory. Standard chain-of-custody forms accompanied each set of soil samples. The sampling tool and brass tubes were decontaminated prior to each sampling event. This included a soap and water wash, tap water rinse and a distilled water rinse. Wash and rinse baths were cleaned and refilled prior to completing each boring.

In addition to the collection of brass tube samples, some sediment was transferred to labeled zip-lock plastic bags and characterized for logging purposes at the end of each day. Accompanying each soil sample description was a comment on odors observed by the geologist. Organic vapor headspace readings and odors were recorded immediately after sample removal from the borings.

Samples were examined according to the following criteria:

Visual logging: Each soil sample was logged in the field. Samples with signs of obvious contamination (e.g. stained soil, discoloration, oily) were noted as well as geologic descriptions;

Odor: Samples with odor characteristics of petroleum hydrocarbons were noted;

Field detector: An Hnu photoionization detector as utilized by holding a closed plastic bag partially filled with the sample and inserting the probe. A volatile emission reading was then recorded. Organic vapor readings were recorded in the field log.

Subsequent to the construction of monitoring wells, HSCI surveyed the locations and elevations WB-7 through WB-14.

Drill cuttings were placed in 55-gallon drums, lids secured, labeled and stored temporarily along the east end of the subject property. Fifteen drums of drill cuttings (two from each boring) and two drums of rinseate remain on-site.

3.2 Groundwater Sampling

Sampling of groundwater was completed June 20, 1994 (three days after drilling). Prior to sampling, water levels were measured in all wells with an M-Scope and all equipment was decontaminated with a soap and water wash, tap water rinse and distilled water rinse. Sampling began by first purging approximately five gallons of groundwater from the well and measuring pH and specific conductance from discharged water. Several iterations of purging and measurements were completed until; 1) pH or specific conductance measurements became stable or 2) the well was dewatered.

A dedicated well developing unit was utilized in each well to minimize the opportunity for cross-contamination. Subsequent to completing well purging, the pump was removed and a water sample collected with a teflon bailer. Samples were placed in two 40ml VOA, a 1-liter amber bottle and when applicable a small plastic, aseptic bottle utilizing a titrating tube. A separate sample was collected from nitrate detection in the field. A LaMotte colorimetric kit was used for this analysis. Wells were sampled in an order beginning with the least contaminated well and ending with the most contaminated well. Samples were immediately placed in a cooler at a reduced temperature. Standard chain-of-custody procedures were followed and samples were delivered to the laboratory within 24 hours.

4.0 SITE PHYSICAL CHARACTERISTICS

When assessing the magnitude and environmental impact of an unauthorized UGST leak, it is necessary to understand the setting of the study area. Identification of landuse, soil criteria unsaturated flow, groundwater aquifers (shallow and deep) and their relation with one another and a working understanding of the potential transport pathways and receptor populations are examined. The following subsection discusses the various regional aspects as well as the site specific subsurface environment. Existence of subsurface and regional information is may times limited therefore the reported hydrogeologic regime is based on best available data to HSCI.

4.1 Surface Features

The subject property is located in a topographically low area approximately 4,500 feet east of the Bay. Elevation of the property is approximately 40 feet above mean sea level and ground surface slopes gently to the west.

The subject property is presently vacant. An old shed, approximately 20 feet by 20 feet is located at the northeast corner of the lot. Ground cover consists of asphalt and several concrete slabs. Debris is scattered throughout the perimeter of the subject property, primarily the northern perimeter.

The subject property is surrounded by; 1) a drainage channel (Temescal Creek) along the northern perimeter, 2) San Pablo Avenue and a high school to the west, 3) 48th Street and commercial/light industrial landuse to the south and 4) a church and residential area to the east.

Land surface of the subject property is flat. The drainage located to the north appears to be 2-3 feet lower than the subject property. The Temescal Creek is illustrated on a 7.5 minute U.S.G.S. topographic map as originating in the vicinity of Adeline Street and 52nd Street and flows west to the high school then approximately one mile north.

4.2 Hydrogeology

The subject property is located on a broad alluvial plain bordered by the Berkeley Hills on the east and San Francisco Bay on the west. Underlying the property is an alluvial fan deposit consisting of sandy silty clay and clayey gravels. Shallowmost groundwater is commonly found at approximately a 20 foot depth. Aquifers potentially existing below shallowmost groundwater are not a part of this investigation therefore not included.

4.3 Soils and the Vadose Zone

Rainfall during the winter months usually saturate the root zone of soils. Prolonged rainless periods in the summer nearly always exhausts the stored moisture which dries the soil. Grade material is asphalt and concrete in over 90 percent of the site with significant breaks and fractures near the concrete slabs.

The geologic profile within the vadose zone (sediment above groundwater table) as indicated from on-site borings is illustrated in figures 4 and 5. There appears to be no trend in sediment type within the topmost 31 feet of material. Typically a clay, silty clay, silt or silty sand may be encountered within this interval. A silty gravel was detected at the 28 foot depth of borings B-8 and B-12.

4.4 Meteorology

The City of Emeryville and western regions of Alameda County have a marine climate with very little change in temperature. The average annual temperature throughout the area is uniform. It ranges between 56 and 58 degrees F west of the coastal hills. Temperatures in the mid summer have exceeded 100 degrees F. The mean maximum temperature in July is in the middle 70s. Low temperatures during January average in the upper 30's or lower 40's. Annual precipitation varies from about 16-20 inches.

5.0 SOURCES OF CONTAMINATION

Historically, the subject property operated as a gasoline service station. Aerial photographs, insurance maps (Sanborn maps) and site landsurface conditions suggest one or several underground

storage tanks may at one time existed beneath the subject property. Location of UGSTs however are not known due to the lack of available documentation.

Based on the above conditions, it is likely that three dispenser islands and a tank system have previously operated at the site.

6.0 CHEMICAL ANALYSIS

Selected soil and groundwater samples from each boring/well were sent to a certified laboratory for analysis of total petroleum hydrocarbons by the following methods:

Modified EPA Method 418.1;
EPA Method 8015;
EPA Method 8020 and
TCLP extraction.

TPHR analysis utilizes modified EPA Method 418.1. This method uses an infared spectrophotometer. Detectable limit is 50 mg/kg.

EPA Method 8015 is a total petroleum hydrocarbons and utilizes a GC-FID detector. The limit of detection is 1.0 mg/kg for soil and 50 ug/l for water.

The EPA Method 8020 analysis is used to determine the concentration of various aromatic volatile organic compounds. This analysis includes direct injection or purge and trap methods and a gas chromatograph to separate the organic compounds. The detectable limit for this method is 0.05 ug/kg for soil and 0.5 ug/l for water.

A TCLP (Toxicity Characteristic Leaching Procedure) test was completed to evaluate the leachability of petroleum to groundwater. A volatile TPH analysis utilizing a TCLP zero headspace extraction was completed.

Two additional tests were performed on selected samples. These included nitrates, total coliform and fecal coliform. Nitrates were analyzed by a LaMotte field chemical kit. Powdered cadmium is used to reduce nitrate to nitrite. Concentration of nitrite that is originally present and the reduced nitrate are determined by diazotizing sulfanilamide and coupling with N-(1 naphthyl)-ethylenediamine dehydrochloride to form a highly colored azo dye which is measured colorimetrically. Detectable

limit is approximately 0.3 mg/l. Total and fecal coliform was analyzed by SM9221. Detectable limit of this method is 2 MPN/100ml (most probable number).

7.0 DATA INTERPRETATION

Interpretation of field generated data has been evaluated with respect to conceptualizing and presenting results in a manner which defines the extent of contamination, transport pathways of the contaminant and the feasibility of remediating the site.

7.1 Extent of Contamination

Evaluation of the lateral and vertical extent of contamination and TPH/BTXE concentrations will be discussed in this section. Data from fourteen borings is utilized to evaluate the extent of soil contamination. Five groundwater monitoring wells is utilized to define the extent of contamination to groundwater.

7.1.1 Soil and the Vadose Zone

A total of 24 soil samples were analyzed by TPHR, TPH-G and/or BTXE. Eight of the 24 samples contained detectable petroleum hydrocarbons. TPH was detected primarily in sediment located between the 8.5 foot and fifteen foot depths. Detectable concentrations ranged between 0.96 - 350 mg/kg TPH-G and 24 - 3900 mg/kg TPHR. Six of the samples contained detectable levels of BTXE ranging between 0.032 and 3.2 mg/kg.

Aerial distribution of petroleum hydrocarbons appear to extend from the south-central to the north-central property boundary. Concentrations appear to be greater in the south half of the subject property. Borings, B-2, B-3 and B-6 contain the greatest levels of TPH-G and BTXE (220/2.96 mg/kg, 350/3.2 mg/kg and 40/1.133 mg/kg, respectively).

One sample was collected from the ten foot depth of WB-8 and analyzed for gasoline by the TCLP method. Approximately 0.96 mg/kg was detected which suggests that the presence of gasoline in the subsurface is leachable and may pose an adverse water quality effect to shallowmost groundwater.

A sample collected from the ten foot depth of boring B-1 contained 3,900 mg/kg TPHR. Several samples were collected in the vicinity of B-1 to evaluate the significance and extent of TPHR presence in this area. Three samples from WB-8 contained nondetectable to 24 mg/kg TPHR. Due to minimal presence of TPHR

in samples collected from WB-8, the high concentration detected in B-1 is likely a very localized area which may contain chips and grains of asphalt mixed with the sediment.

A soil sample collected from the 4-5 foot depth of boring B-6 contained 990 mg/kg TPHR. Several samples were collected in the vicinity of B-6 to evaluate the significance and extent of TPHR presence in this area. Two samples from WB-12 contained nondetectable TPHR. TPHR in groundwater at WB-14 contained 1.1 mg/l and TPHR at WB-12 contained 1.7 mg/l. Due to minimal presence of TPHR in samples collected from WB-8, the high TPH concentration detected in B-1 is likely a very localized area. The source of TPHR may be subsurface fill material containing asphalt chips.

7.1.2 Groundwater

Five groundwater monitoring wells were constructed to evaluate groundwater conditions. Four of the wells were drilled to a total depth of 31 feet and perforated between the 20 and 30 foot depth interval. Well construction was completed in a manner consistent with Alameda County Environmental Health requirements.

Saturated sediment was detected in borings WB-7, WB-8, WB-9, B-10, B-11, WB-12 and B-13 between the 20 and 27 foot depth interval. Water levels measured in the monitor wells several days after the wells were constructed were significantly more shallow (i.e. 9.62 ft. for WB-7, 10.87 ft. for WB-8, 13.48 ft. for WB-9 and 10.40 ft. for WB-12). Due to the difference in water levels measured in the monitor wells versus first encountered saturated sediment, groundwater appears to exist under a semi-confined condition.

Boring B-6 and WB-14 encountered a different lithology as well as a perched groundwater condition. Each boring penetrated a reddish-brown, very fine grained sand to a 7.5-10 foot depth. Groundwater elevation in this area was 87.42 (7 foot depth) in June and 86.65 (7.77 foot depth) in July 1994.

Potential sources of groundwater recharge include; 1) the Temescal Creek, 2) the sanitary sewer and 3) the storm sewer. Temescal Creek may not be a significant source for groundwater recharge however its intermittent flow and down-gradient location from WB-14 lessen its effect to the Subject Property.

Possible recharge of groundwater and associated contaminants typically existing in the sanitary sewer system were evaluated by analysis of nitrate, total coliform and fecal coliform. Releases of TPH from the sewer system is a possibility which is being examined by interpreting indicator parameters. Sometimes nitrates can be used as an indicator when background water quality is low in nitrates. Sanitary sewers act as a source of nitrate and transmit nitrate to groundwater through leaks and fractures existing in the sewer system network of pipes. Nitrate concentrations were nondetectable in WB-8, WB-9 and WB-14 and 9.2 mg/l in WB-8. These concentrations and their distribution do not suggest nitrate loading of groundwater from the sewer system.

The coliform group of bacteria includes all aerobic and facultative anaerobic bacteria. E. coli is a normal inhabitant of the intestine of warm-blooded animals, including humans. The presence of this organism can be utilized as an indicator of fecal matter of humans and animals. Two wells were sampled for coliform, WB-12 and WB-14. Monitor well WB-12 contained no detectable total coliform and fecal coliform. Monitor well WB-14 however contained 9,000 MPN/100 ml total coliform. Presence of this concentration in WB-14 suggests cross contamination of the sample bottle. Due to no detectable fecal coliform in the samples, it is not likely that the sewer system is acting as a source of water and TPH.

Water is likely recharging the groundsurface as a result of the close proximity of the storm sewer system and the more permeable material (i.e. very fine grained sand) in the vicinity of WB-14. A storm pipe is located within approximately 10-15 feet of WB-14 and B-6. The perched condition may also be recharging the groundwater table existing at the 20-27 foot interval. This is evident by the mounding anomaly present in the vicinity of WB-8 and B-1.

Water level measurements were collected June 20 and July 27, 1994. Figure 3 illustrates groundwater table contour lines. A relative elevation was used instead of mean sea level. According to June 1994 water level data, groundwater table slopes 0.0364 foot per foot to the north. Groundwater contours were interpreted by the inverse distance method. This interpretation revealed a mound in the vicinity of WB-8 and B-1. A mound was also present during July 1994 however not as pronounced. Water elevations declined approximately 0.75 feet between June and July 1994.

BTXE and TPH-G were analyzed from water samples collected from each monitor well. Results from this analysis are tabulated in Table 2. Three wells contained detectable concentrations of BTXE and TPH-G (WB-14, WB-8 and WB-9). TPH-G levels ranged from 230 ug/l to 1,900 ug/l. The concentration gradient appears to decrease to the north. Groundwater table slope also decreases to the north.

Although BTXE concentrations were detected in WB-14, WB-8 and WB-9, toluene, xylene and ethylbenzene levels were below the MCL enforced by the State of California and Federal Government. Benzene however is detected at 2.8-3.0 ug/l near WB-8 and WB-9 and 65 ug/l at WB-14. According to SW846 (December 1987), laboratory accuracy and precision data for benzene is described as deviating 1.2 (standard deviation recovery). Based on typical field and laboratory error, the true concentration of benzene is slightly over the MCL (1.0 ug/l) for WB-8 and WB-9. WB-14 however is significantly higher. Due to the likely hydrogeologic connection between the perched groundwater condition and groundwater table, it is likely that contaminated groundwater existing in the very fine grained sand adjacent B-6 and WB-14 act as a source for petroleum. Diffusion, adsorption and biological degradation may potentially reduce TPH concentrations however measurement of these effects has not been evaluated in this investigation. A ten-fold reduction in benzene concentrations is however noted between WB-12 and WB-9 (a distance of 55 feet).

8.0 SUMMARY AND CONCLUSIONS

Previous investigations have been completed at the subject property and include: 1) a soil-gas survey, 2) an aerial photo search and 3) a drilling and sampling program consisting of six borings.

The first drilling program concluded that detectable levels of TPH and BTXE was present in subsurface soil at several locations. HydroSolutions of California, Inc. attended a meeting with the City of Emeryville and present owners of the subject property to discuss the conclusions of all investigative actions (February 23, 1994). Both the City and present subject property owner agreed to submit an unauthorized release form to the Alameda County Environmental Health Department and schedule a meeting with the County and Regional Water Quality Control Board. Discussions with the agencies would include conclusions of the drilling and sampling program and future assessment and cleanup

requirements likely to be requested by the regulatory agencies. Alameda County Environmental Health (County) was identified as the lead agency for this situation.

This field program is designed to evaluate groundwater quality and extent of contamination.

8.1 Nature and Extent of Contamination

Aerial distribution of petroleum hydrocarbons appear to extend from the south-central to the north-central property boundary. Concentrations appear to be greater in the south half of the subject property. Borings, B-2, B-3 and B-6 contain the greatest levels of TPH-G and BTXE (220/2.96 mg/kg, 350/3.2 mg/kg and 40/1.133 mg/kg, respectively).

One sample was collected from the ten foot depth of WB-8 and analyzed for gasoline by the TCLP method. Approximately 0.96 mg/kg was detected which suggests that the presence of gasoline in the subsurface is leachable and may pose an adverse water quality effect to shallowmost groundwater.

A sample collected from the ten foot depth of boring B-1 contained 3,900 mg/kg TPHR. Several samples were collected in the vicinity of B-1 to evaluate the significance and extent of TPHR presence in this area. Three samples from WB-8 contained nondetectable to 24 mg/kg TPHR. Due to minimal presence of TPHR in samples collected from WB-8, the high concentration detected in B-1 is likely a very localized area which may contain chips and grains of asphalt mixed with the sediment.

A soil sample collected from the 4-5 foot depth of boring B-6 contained 990 mg/kg TPHR. Several samples were collected in the vicinity of B-6 to evaluate the significance and extent of TPHR presence in this area. Two samples from WB-12 contained nondetectable TPHR. TPHR in groundwater at WB-14 contained 1.1 mg/l and TPHR at WB-12 contained 1.7 mg/l. Due to minimal presence of TPHR in samples collected from WB-8, the high TPH concentration detected in B-1 is likely a very localized area. The source of TPHR may be subsurface fill material containing asphalt chips.

Possible recharge of groundwater and associated contaminants typically existing in the sanitary sewer system were evaluated from nitrate, total coliform and fecal coliform analyses. Releases of TPH from the sewer system is a possibility which is being examined by interpreting indicator parameters.

Nitrate concentrations were nondetectable in WB-8, WB-9 and WB-14 and 9.2 mg/l in WB-8. These concentrations and their distribution do not suggest nitrate loading of groundwater from the sewer system.

Two wells were sampled for coliform, WB-12 and WB-14. Monitor well WB-12 contained no detectable total coliform and fecal coliform. Monitor well WB-14 however contained 9,000 MPN/100 ml. Due to no detectable fecal coliform in the samples, it is not likely that the sewer system is acting as a source of water and TPH.

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Water is likely recharging the groundsurface as a result of the close proximity of the storm sewer system and the more permeable material (i.e. very fine grained sand) in the vicinity of WB-14. A storm pipe is located within approximately 10-15 feet of WB-14 and B-6. The perched condition may also be recharging the groundwater table existing at the 20-27 foot interval. This is evident by the mounding anomaly present in the vicinity of WB-8 and B-1.

BTXE and TPH-G were analyzed from water samples collected from each monitor well. Results from this analysis are tabulated in Table 2. Three wells contained detectable concentrations of BTXE and TPH-G (WB-14, WB-8 and WB-9). TPH-G levels ranged from 230 ug/l to 1,900 ug/l. The concentration gradient appears to decrease to the north. Groundwater table slope also decreases to the north.

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8.2 Recommended Remedial Actions

Based on the depth of contamination in the unsaturated zone, TPH and BTXE concentrations in subsurface sediment, groundwater quality with respect to benzene and the existence of a contaminated perched groundwater condition, HSCI suggests a two-tier remedial alternative. The chosen alternative must be approved by the Alameda County Environmental Health and Regional Water Quality Control Board. Modification of the remedial option may be considered in gaining acceptance by the regulators.

The aquifer matrix of the perched groundwater aquifer (detected at B-6 and WB-14) will be excavated and spread across the subject property. Aeration and biodegradational processes will contribute in the removal of the volatile fraction of petroleum present in the material. Optimum results occur during the hot days therefore HSCI suggests that this option be implemented during the summer.

Subsequent to removing contaminated sediment, the excavation will be either bordered by a fence or backfilled. The City of Emeryville and its redevelopment agency will be involved in this decision. Cost of backfilling will significantly increase the cost of remediation however potential liabilities associated with leaving an open excavation may exceed backfill costs.

Lastly, spread of contaminated sediment will be sampled and analyzed for TPH-G and BTXE. Assuming levels of contaminants meet regulatory requirements, the sediment may be disposed as a Class III material or utilized on-site.

Due to concentrations of benzene existing at 2-3 ug/l (1-2 ug/l above the MCL) in monitor wells, WB-8 and WB-9, HSCI suggests monitoring WB-7, WB-8, WB-9 and WB-12 on a quarterly basis for one year. If quarterly data of BTXE and TPH concentrations reveal no trend or a decreasing trend, monitoring would be terminated and no further action would be required. An increasing trend would result in initiating removal of contaminated soil to a ten foot depth in the unsaturated zone adjacent B-1, B-2 and B-3.

Currently fifteen 55-gallon drums of drill cuttings and three 55-gallon drums of rinseate and discharged groundwater have been temporarily stored on-site. Based on laboratory analyses, eight drums (i.e. WB-7, WB-11, WB-12 and B-13, two drums from each boring) do not contain detectable TPH/BTXE. Seven 55-gallon drums contain TPH/BTXE that may require a manifested disposal to an appropriate facility. Lastly, three drums containing water may require a manifested disposal. County approval for procedures, minimum contaminant requirments, and approved disposal practices will be verified prior to drum removal.

	TPHR	TPH-G	BENZENE	TOLUENE	XYLENES	ETHYL-BENZENE
WB-7-10	-	<1	<0.005	<0.005	<0.015	<0.005
WB-7-20	-	<1	<0.005	<0.005	<0.015	<0.005
WB-8-15	<50	<1	<0.005	<0.005	<0.015	<0.005
WB-8-20	<50	<1	<0.005	<0.005	<0.015	<0.005
WB-9-15	<50	2.5	0.015	0.007	0.12	0.084
WB-9-20	<50	<1	<0.005	<0.005	<0.015	<0.005
B-10-10	-	1.5	<0.005	0.007	0.017	0.008
B-10-20	-	<1	<0.005	<0.005	<0.015	<0.005
B-11-10	-	<1	<0.005	<0.005	<0.015	<0.005
B-11-20	-	<1	<0.005	<0.005	<0.015	<0.005
WB-12-10	<50	<1	<0.005	<0.005	<0.015	<0.005
WB-12-20	<50	<1	<0.005	<0.005	<0.015	<0.005
B-13-10	-	<1	<0.005	<0.005	<0.015	<0.005
B-13-20	-	<1	<0.005	<0.005	<0.015	<0.005
WB-8-10	24	0.96	-	-	-	-

TPHR analyzed by EPA Method 418.1, oil & grease by IR spectrophotometer. Detectable limit is 50 mg/kg.
TPH-G analysis by EPA Method 5030 Purge & Trap. Detectable limit is 1 mg/kg.
Benzene, toluene, xylene and ethylbenzene analysis by EPA Method 8020. Detectable limit for benzene, toluene and ethylbenzene is 0.005 mg/kg and xylene is 0.015 mg/kg.
WB-8-10 was analyzed by TPH Volatile analysis utilizing a TCLP zero headspace extract.

Title: TABLE 1. SOIL LABORATORY DATA

Project No.: 94286-03

HydroSolutions of California, Inc.
5917 Moss Creek Circle, Suite 2
Fair Oaks, California
(916) 967-1222

Site: 4800 SAN PABLO AVENUE
EMERYVILLE, CALIFORNIA

Scale: NONE

Date: 07-25-94

	TPHR	TPH-G	BENZENE	TOLUENE	XYLENES	ETHYL-BENZENE	NITRATE	TOTAL COLIFORM	FECAL COLIFORM
WB-7	<1	<50	<0.3	<0.3	<0.9	<0.3	-	-	-
WB-8	<1	230	3.0	1.0	<0.9	0.6	<0.3	-	-
WB-9	<1	270	2.8	1.3	<0.9	<0.3	<0.3	-	-
WB-12	1.7	<50	<0.3	<0.3	<0.9	<0.3	9.2	<2	<2
WB-14	1.1	1900	65	3.2	10	<0.3	<0.3	9000	<2
MCL	-	-	1	100	1750	680	10		

NOTES:
All chemical analysis reported in ug/l (ppb).
TPH analyzed by SM5520, Oil & Grease. Detectable limit is 1mg/l.
TPH-G analyzed by EPA Method 5030 Purge-and-Trap. Detectable limit is 50 ug/l.
Benzene, toluene, xylene and ethylbenzene analyzed by EPA Method 602. Detectable limit is 0.3 ug/l for benzene, toluene and ethylbenzene and 0.9 ug/l for xylene.
Nitrate analyzed in the field by a LaMotte field kit. Powdered cadmium is used to reduce nitrate to nitrite. The nitrite that is originally present and the reduced nitrate is determined by diazotizing sulfanilamide and coupling with N-(1 naphthyl)-ethylenediamine dehydrochloride to form a highly colored azo dye which is measured colorimetrically. Detectable limit is approximately 0.3 mg/l.
Total and Fecal Coliform analyzed by SM9221. Detectable limit is 2 MPN/100 ml.
Shaded areas identify results which exceed the MCL.)

HydroSolutions of California, Inc.
5917 Moss Creek Circle, Suite 2
Sacramento, California 95628-2714
(916)967-1222

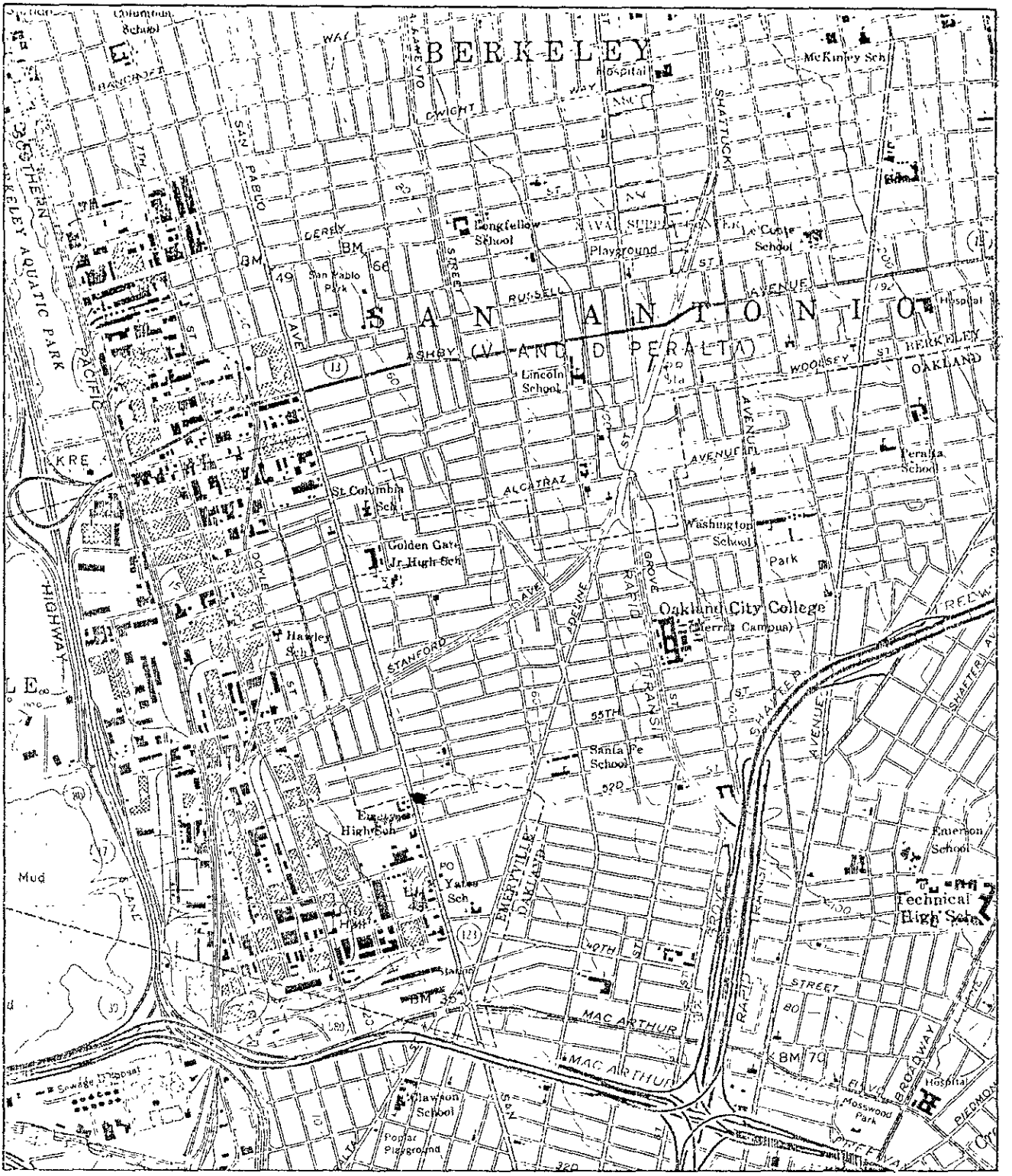
Title: GROUNDWATER QUALITY
Site: 4800 SAN PABLO AVENUE
EMERYVILLE, CALIFORNIA
Project Number: 94286-03
Date: 07-25-94
Scale: NONE

TABLE 2

TABLE 3. LABORATORY ANALYSIS

Sample Location	B	T	X	E	TPH-G	418.1
B-1-(6-7)	ND	ND	ND	ND	ND	ND
B-1-(10-10.5)	ND	0.019	0.36	0.044	7.1	3900
B-2-(8-10)	0.13	0.4	1.8	0.63	220	ND
B-2-(13-15)	ND	ND	ND	ND	ND	ND
B-3-(8-10)	0.96	ND	1.6	0.64	350	ND
B-3-(13-15)	ND	ND	ND	ND	ND	ND
B-4A-(8-10)	ND	ND	ND	ND	ND	ND
B-6-(4-5)	ND	ND	ND	ND	ND	990
B-6-(8.5-10)	0.063	ND	0.75	0.32	40	ND

Results reported in mg/kg (ppm).
No detectable levels of TPH-D and STLC Lead were detected in the above samples.
BTXE is benzene, toluene, xylene, and ethylbenzene.
BTXE analysis by EPA Method 8020. Reporting limit is 0.005 mg/kg.
TPH-Gasoline analysis by EPA Method 5030 Purge-and-trap, Reporting limit is 1 mg/kg.
TPH-Diesel analysis by modified EPA Method 8015. Reporting limit is 1 mg/kg.
Oil & Grease analysis by EPA Method 418.1 (IR Spectrophotometer). Reporting limit is 50 mg/kg.
Soluble Lead analysis by Lead STLC. Reporting limit is 0.05 mg/kg.
Lowest reporting limits are listed above. If sample extraction is diluted, reported limit increases accordingly (see laboratory reports).



● SUBJECT PROPERTY

Reproduced from USGS 7.5 Minute Series V895 (topographic)

Title: SUBJECT PROPERTY LOCATION MAP

Project No.: 93286-01

FIGURE 1

HydroSolutions of California, Inc.

11470 Sunrise Gold Circle, Suite 4
Rancho Cordova, California 95742
(916) 852-0188

Site: 4800 San Pablo Avenue
Emeryville, California

Scale: 1 inch=2,000 feet

Date: 11-16-93

NOTES:

Exploratory drilling completed on December 23, 1993.

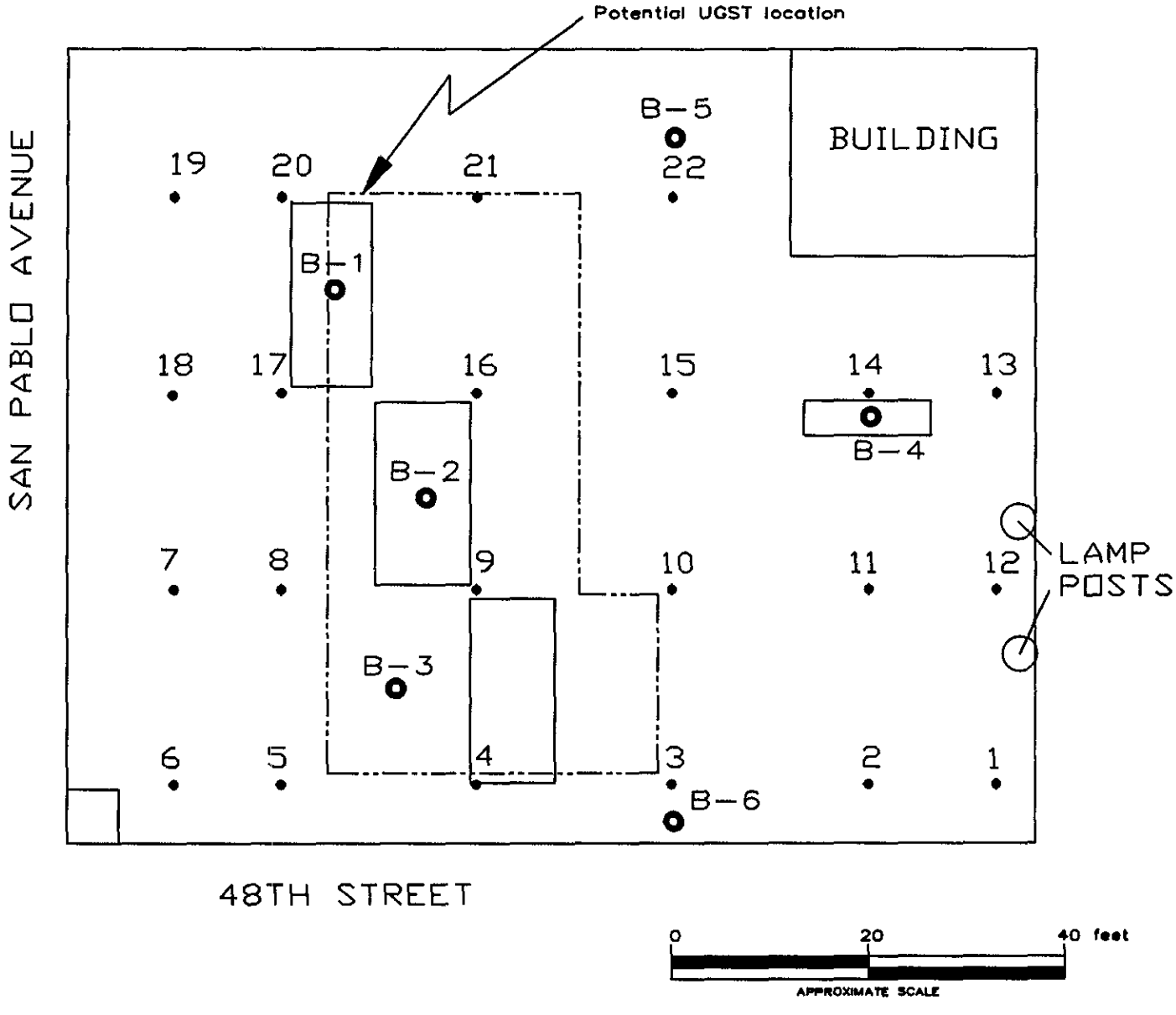
A Geoprobe system was used as the coring device.

Groundwater was encountered in boring, B-6, at 8.5 feet. Borings, B-1 through B-5 did not penetrate groundwater.

Soil-gas probes are illustrated as solid dots. Twenty two probes were inserted to a 4.5-10.5 foot depth.

Soil samples analyzed for total petroleum hydrocarbons, benzene, toluene, xylene, ethylbenzene, oil & grease, and soluble lead.

Dashed line illustrates area which magnetic anomalies were measured with a Metrotech Model 810 Radio Frequency Line Tracer and Schonstadt MAC 51-B Magnetic and Cable Locator tool.



HydroSolutions of California, Inc.
5917 Moss Creek Circle, Suite 2
Fair Oaks, California 95628-2714
(916)967-1222

Title: EXPLORATORY BORING PROGRAM

Site: 4800 SAN PABLO AVENUE
EMERYVILLE, CALIFORNIA

Project Number: 93285-02

Date: 01-10-94

Scale: AS SHOWN

FIGURE 2

NOTES:

Exploratory drilling completed December 23, 1993 and June 16-17, 1994.

A Geoprobe system was used as the coring device for B-1 through B-6. A hollow stem augur was utilized for WB-7 through B-13.

Groundwater was encountered in boring, B-6, at 8.5 feet. Borings, B-1 through B-5 did not penetrate groundwater.

Soil-gas probes are illustrated as small dots. Twenty two probes were inserted to a 4.5-10.5 foot depth. Probes were removed after use.

Soil samples analyzed for total petroleum hydrocarbons, benzene, toluene, xylene, ethylbenzene, oil & grease, and soluble lead (B-1 through B-6).

Dashed line illustrates area which magnetic anomalies were measured with a Metrotech Model 810 Radio Frequency Line Tracer and Schonstadt MAC 51-B Magnetic and Cable Locator tool.

Ground water monitoring wells designated as WB-___ . All wells except WB-14 are 30 feet deep, perforated between the 20 and 30 foot depths, gravel pack to 18 foot depth and grouted to the ground surface. A locking well head is constructed at grade for each well.

Well, WB-14, is 12 feet in depth, perforated between 7 and 12 feet, gravel packed to a 5 foot depth and grouted to the ground surface.

Water samples from WB-8, WB-9 and WB-14 contained benzene concentrations above the MCLs. Petroleum hydrocarbon concentrations were detected as follows:

WB-7	<50 UG/L
WB-8	230 UG/L
WB-9	270 UG/L
WB-12	<50 UG/L
WB-14	1900 UG/L

Direction of groundwater table slope is to the north.

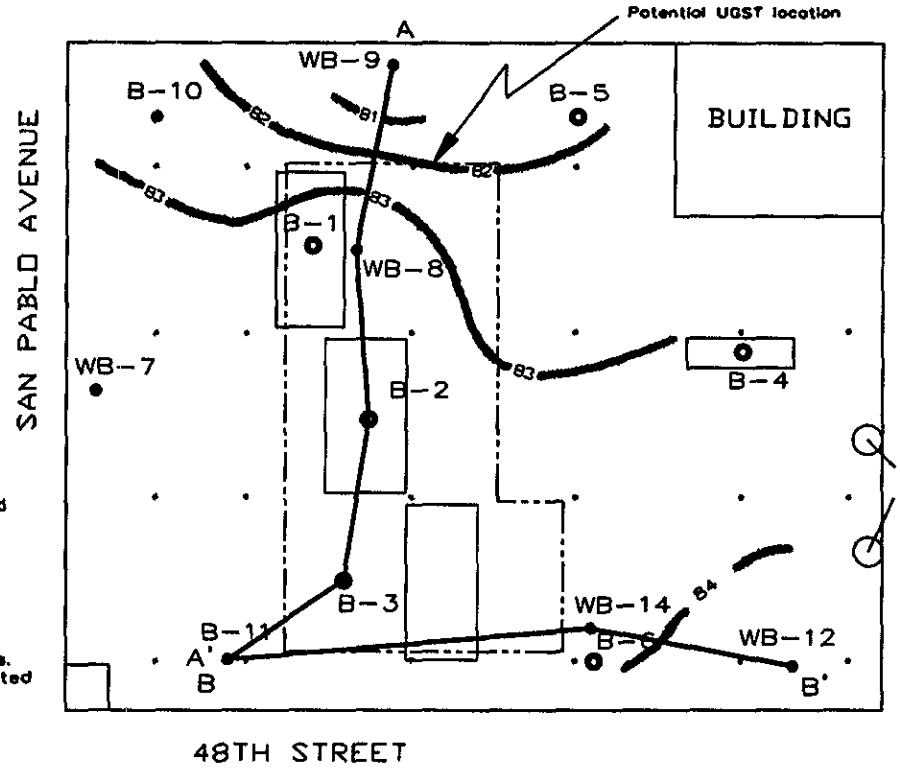
Table 1 summarizes chemical results from soil samples (June 1994).
Table 2 summarizes chemical results from soil and water samples (June 1994).
Table 3 summarizes chemical results from soil samples (December 1993).

Cross sections illustrated in figures 4 and 5.

Ground water level elevations are relative elevations.

Borings, WB-7 through B-13, were surveyed with a transit and rod.

Groundwater contour lines calculated by inverse distance method. Data includes WB-7,8,9 and 12.



EXPLANATION

B-5 BORING

WB-7 GROUNDWATER MONITOR WELL

80 GROUNDWATER TABLE CONTOUR LINE AND RELATIVE ELEVATION (FT)

SOIL-GAS SAMPLE

A A' CROSS SECTION

0 20 40 feet
APPROXIMATE SCALE

B-13

HydroSolutions of California, Inc.
5917 Moss Creek Circle, Suite 2
Fair Oaks, California 95628-2714
(916) 967-1222

Title	PHASE II DRILLING PROGRAM
Site	4800 SAN PABLO AVENUE EMERYVILLE, CALIFORNIA
Project Number	94286-03
Date	07-21-94
Scale	AS SHOWN
FIGURE	3

FIGURE 4 NORTH-SOUTH CROSS-SECTION
4800 SAN PABLO AVENUE, SACRAMENTO

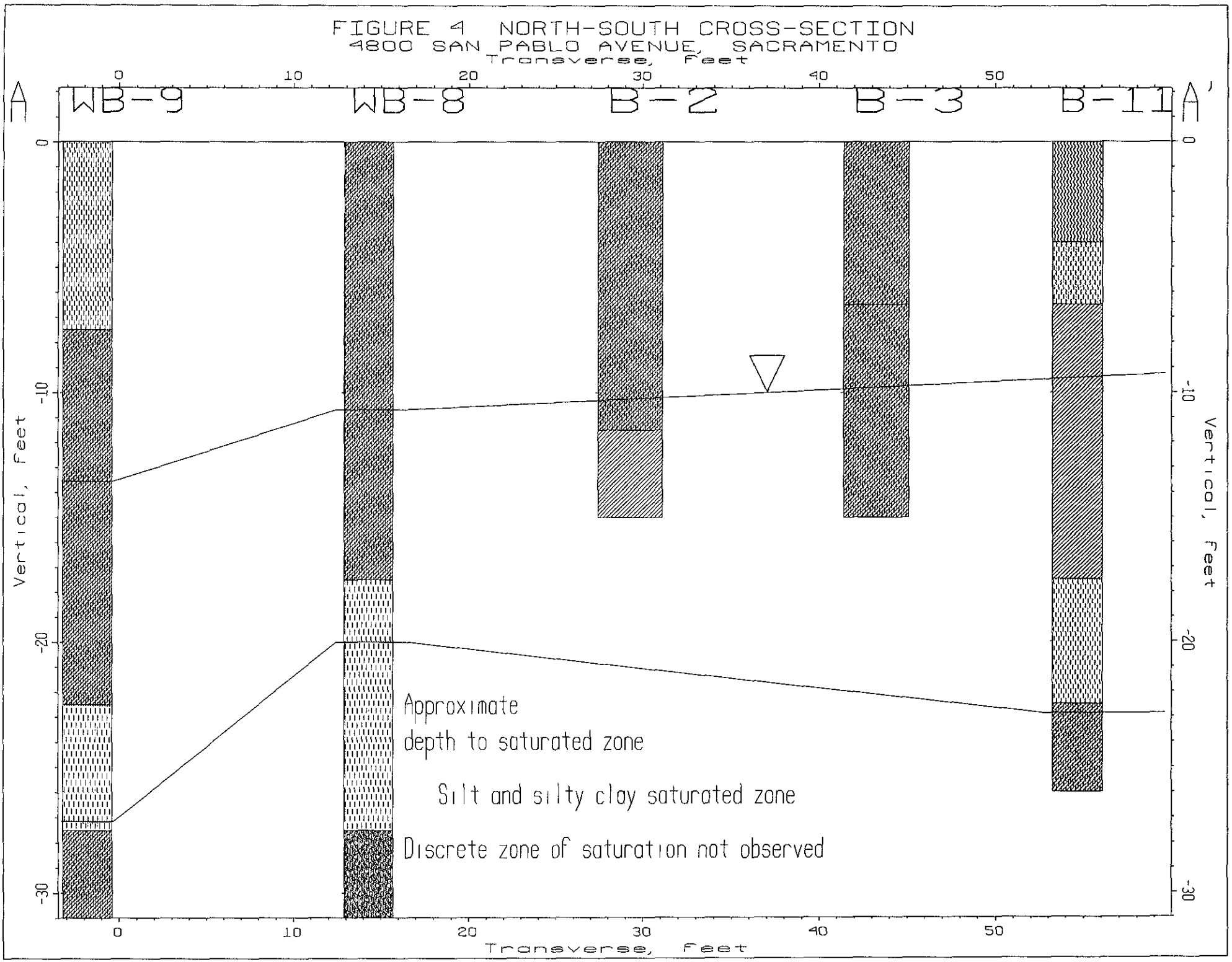
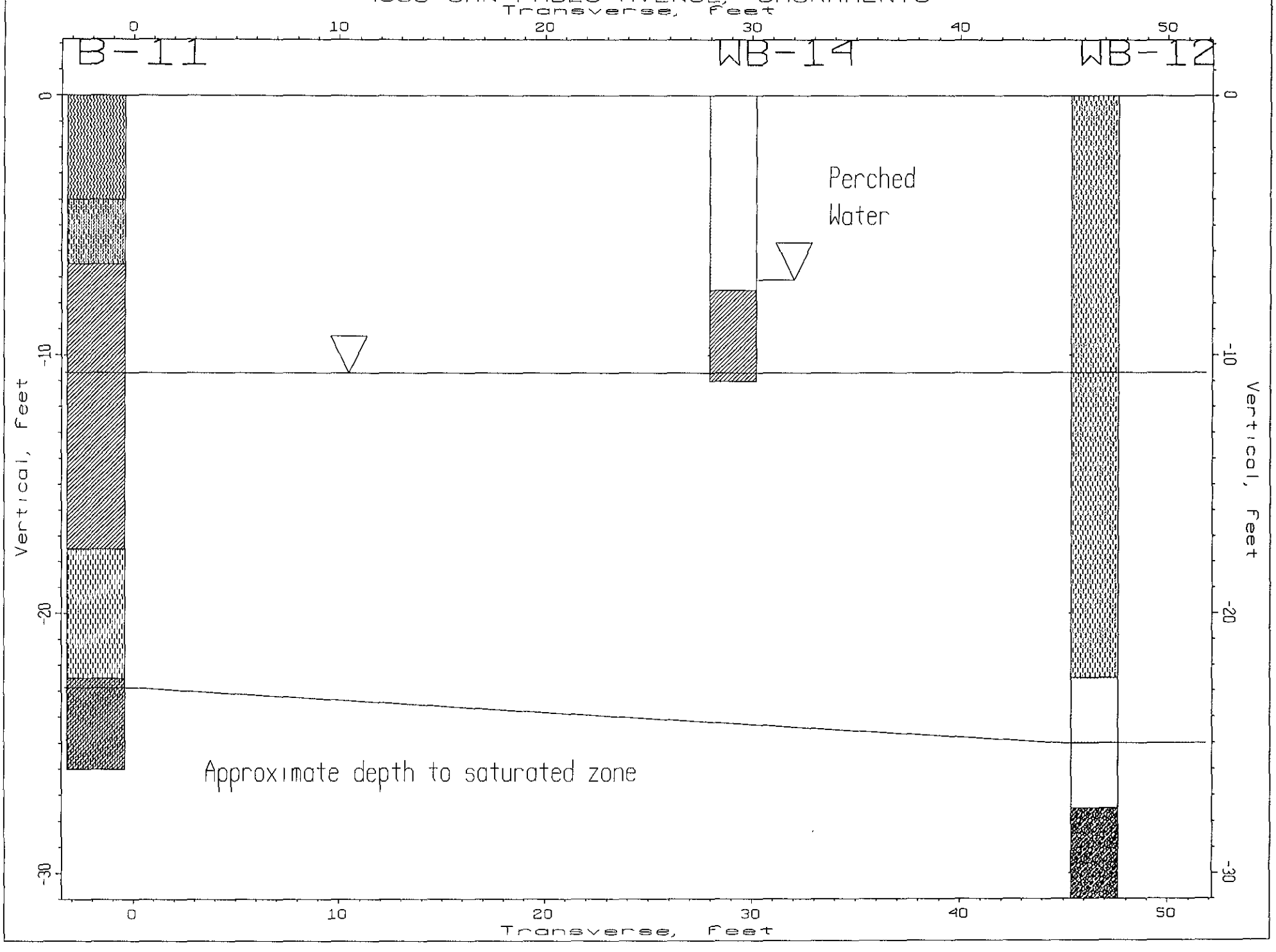


FIGURE 5 EAST-WEST CROSS-SECTION
4800 SAN PABLO AVENUE, SACRAMENTO



APPENDICIES

Appendix A. Geologic Logs

SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	93286-02
DRILL COMPANY	Artesian Environmental Consultants	DATE STARTED	12-23-93
DRILL EQUIPMENT	Geoprobe System, 1 7/8 inch dia	DATE FINISHED	12-23-93
GEOLGIST	Steve Baker	FIRST WATER, FT	NONE
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	10 5

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

BORING B-1

DEPTH BGS	C	W	BLOWS PER 6"	S	OV (PPM)	LOG	DESCRIPTION
0							CLAY (CL), moist, brown, dark brown, some fine grained sand, some gravel (1/8-1/4" dia), no petroleum-like odor
							fast penetration (soft)
10							REFUSAL (encountered concrete)
20							
							Samples collected with a 1 88" dia geoprobe core
							Collection tubes were covered with teflon wrap, capped with PVC caps, taped and labeled
30							
							S means sample locations
							W means well seal log
							C means well casing log
							Information is not to be used for any engineering purposes
							Samples collected at specified intervals
40							

SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	93286-02
DRILL COMPANY	Artesian Environmental Consultants	DATE STARTED	12-23-93
DRILL EQUIPMENT	Geoprobe System, 1 7/8 inch dia	DATE FINISHED	12-23-93
GEOLGIST	Steve Baker	FIRST WATER, FT	NONE
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	15

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

BORING B-2

DEPTH BGS	C	W	BLOWS PER 6"	S	OV (PPM)	LOG	DESCRIPTION
0							SILTY CLAY (CL), moist, brown, yellow-brown, grey-brown, old petroleum-like odor
10					40 ppm		CLAY (CL), moist, brown, yellow-brown, silty, no petroleum-like odor
20							
30							
40							

Samples collected with a 1 88" dia geoprobe core
Collection tubes were covered with teflon wrap, capped with PVC caps, taped and labeled

S means sample locations
W means well seal log
C means well casing log
Information is not to be used for any engineering purposes
Samples collected at specified intervals

SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	93286-02
DRILL COMPANY	Artesian Environmental Consultants	DATE STARTED	12-23-93
DRILL EQUIPMENT	Geoprobe System, 1 7/8 inch dia	DATE FINISHED	12-23-93
GEOLGIST	Steve Baker	FIRST WATER, FT	NONE
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	15

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

BORING B-3

DEPTH BGS	C	W	BLOWS PER 6"	S	OV (PPM)	LOG	DESCRIPTION
0							
							SILTY CLAY (CL), moist, green, brown nodules, silty, some very fine grained sand, petroleum-like odor
					9 ppm, old petroleum-like odor		
							SILTY CLAY (CL), moist, brown, yellow-brown, silty
10					25 ppm, gasoline-like odor		
					0 ppm, no petroleum-like odor		
20							
							Samples collected with a 1 88" dia geoprobe core
							Collection tubes were covered with teflon wrap, capped with PVC caps, taped and labeled
30							
							S means sample locations
							W means well seal log
							C means well casing log
							Information is not to be used for any engineering purposes
							Samples collected at specified intervals
40							

SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	93286-02
DRILL COMPANY	Artesian Environmental Consultants	DATE STARTED	12-23-93
DRILL EQUIPMENT	Geoprobe System, 1 7/8 inch dia	DATE FINISHED	12-23-93
GEOLGIST	Steve Baker	FIRST WATER, FT	NONE
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	15

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

BORING B-4A

DEPTH BGS	C	W	BLOWS PER 6"	S	OV (PPM)	LOG	DESCRIPTION
0							SILTY CLAY (CL), moist, brown, yellow-brown, silty, no petroleum-like odor
							2 ppm, no petroleum-like odor
10							0 ppm, no petroleum-like odor
							1 ppm, no petroleum-like odor
							First attempt resulted in refusal at 5 ft Very easy drilling Moved to new location 2 5 ft away and redrilled as WB-4A
20							Boring located in middle of concrete patch
							Samples collected with a 1 88" dia geoprobe core
							Collection tubes were covered with teflon wrap, capped with PVC caps, taped and labeled
30							
							S means sample locations
							W means well seal log
							C means well casing log
							Information is not to be used for any engineering purposes
							Samples collected at specified intervals
40							

SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	93286-02
DRILL COMPANY	Artesian Environmental Consultants	DATE STARTED	12-23-93
DRILL EQUIPMENT	Geoprobe System, 1 7/8 inch dia	DATE FINISHED	12-23-93
GEOLGIST	Steve Baker	FIRST WATER, FT	NONE
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	2

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

BORING B-5

DEPTH BGS	C	W	BLOWS PER 6"	S	OV (PPM)	LOG	DESCRIPTION
0							REFUSAL (encountered concrete)
							Moved 2 ft and redrilled
							REFUSAL at 1 foot
							ABORTED B-5 LOCATION
10							
20							
30							
40							

S means sample locations
W means well seal log
C means well casing log
Information is not to be used for any engineering purposes
Samples collected at specified intervals

SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	93286-02
DRILL COMPANY	Artesian Environmental Consultants	DATE STARTED	12-23-93
DRILL EQUIPMENT	Geoprobe System, 1 7/8 inch dia	DATE FINISHED	12-23-93
GEOLGIST	Steve Baker	FIRST WATER, FT	8 5 feet
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	12 feet

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

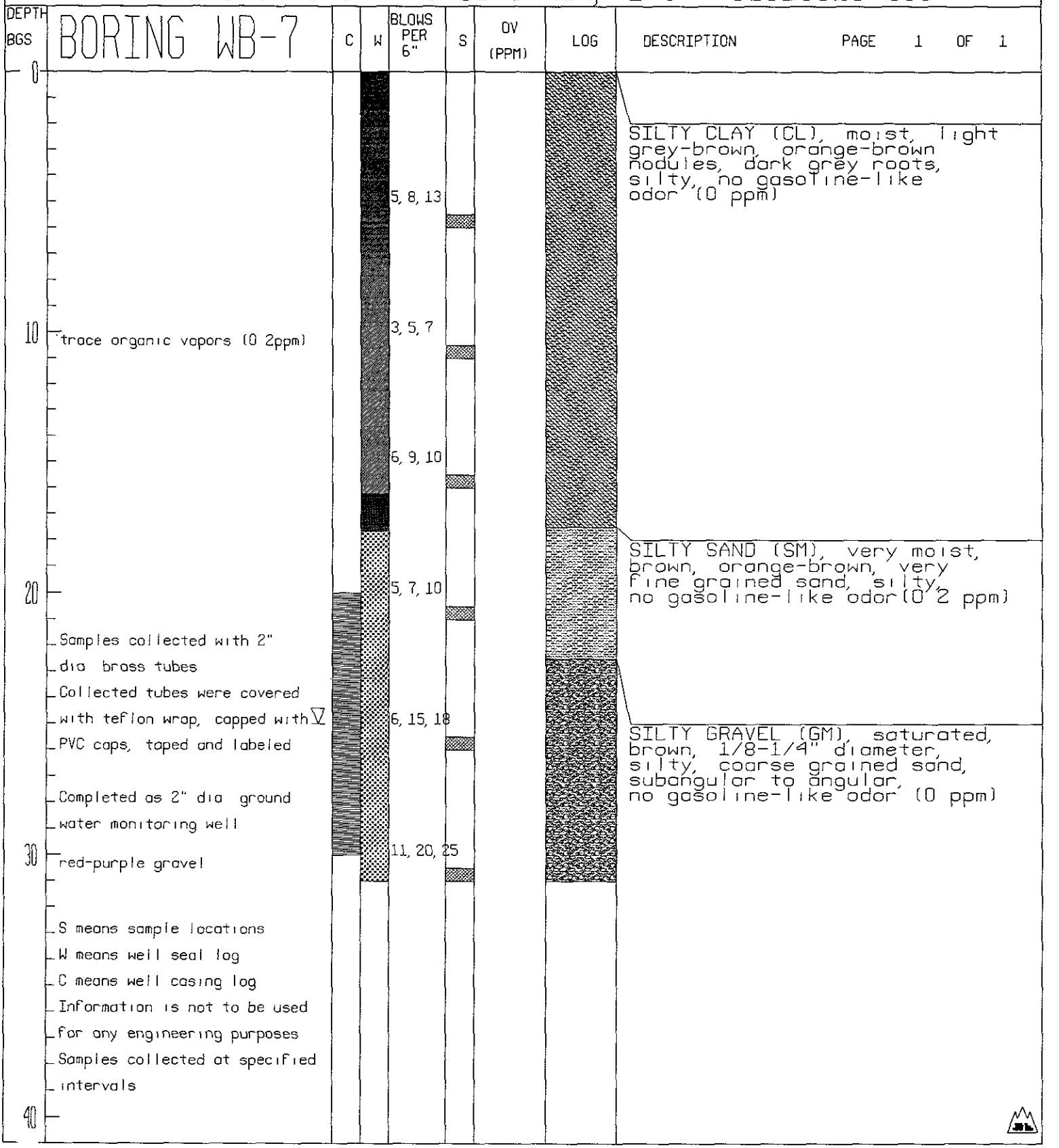
BORING B-6

DEPTH BGS	C	W	BLOWS PER 6"	S	OV (PPM)	LOG	DESCRIPTION
0							SAND (SW), moist to very saturated, dark brown, very fine to fine grained, some gravel (1/4"), no petroleum-like odor
10							green, black color petroleum-like odor sampled water with bailer after drilled to 12 feet attempted to collect a groundwater sample by redrilling to 12 ft and opened the hydropunch-like tool approx 2 ft
20							Limited recovery
							Samples collected with a 1 88" dia geoprobe core Collection tubes were covered with teflon wrap, capped with PVC caps, taped and labeled
30							
							S means sample locations W means well seal log C means well casing log Information is not to be used for any engineering purposes Samples collected at specified intervals
40							

SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	94286-03
DRILL COMPANY	V&W Drilling	DATE STARTED	6-16-94
DRILL EQUIPMENT	Mobile B-61, 8" augur	DATE FINISHED	6-16-94
GEOLGIST	Steve Baker	FIRST WATER, FT	25 feet
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	31 feet

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

BORING WB-7



SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	94286-03
DRILL COMPANY	V&W Drilling	DATE STARTED	6-17-94
DRILL EQUIPMENT	Mobile B-61, 8" augur	DATE FINISHED	6-17-94
GEOLGIST	Steve Baker	FIRST WATER, FT	27-30 feet
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	31 feet

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

BORING WB-8

DEPTH BGS	C	W	BLOWS PER 6"	S	OV (PPM)	LOG	DESCRIPTION
0							CLAYEY SILT (ML), moist, light brown, some orange-brown patches, dark grey-brown nodules, clayey
			5, 13, 13				
10			5, 6, 7				grey nodules looks like worm-holes, gasoline odor (200 ppm)
			4, 7, 8				1 4 ppm organic vapor
20			5, 6, 6				0 4 ppm organic vapor
			3, 4, 6				Samples collected with 2" dia brass tubes Collected tubes were covered with teflon wrap, capped with PVC caps, taped and labeled
							SANDY SILT (ML), moist, brown, orange-brown, very fine grained sand, silt, trace coarse grained sand, no gasoline-like odor
							▽
							Completed as 2" dia ground water monitoring well
30			19, 45				SILTY GRAVEL (GM), saturated, brown, black gravel, 1/8-1/2" diameter, angular to subangular, medium to very coarse grained sand, no gasoline-like odor (0 ppm)
							S means sample locations W means well seal log C means well casing log Information is not to be used for any engineering purposes Samples collected at specified intervals
40							

SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	94286-03
DRILL COMPANY	V&W Drilling	DATE STARTED	6-16-94
DRILL EQUIPMENT	Mobile B-61, 8" augur	DATE FINISHED	6-16-94
GEOLGIST	Steve Baker	FIRST WATER, FT	20 feet
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	31 feet

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

BORING WB-9

DEPTH BGS	C	W	BLOWS PER 6"	S	OV (PPM)	LOG	DESCRIPTION
0							SILT (ML), moist, light brown, orange-brown, very fine grained sand within orange-brown areas, some light brown, very fine grained sand, no gasoline-like odor
			6, 8, 12				
10			4, 5, 8				CLAYEY SILT (ML), very moist, light brown, clayey, some orange-brown nodules
							0 2 ppm organic vapors
			8, 10, 17				some orange-brown nodules 44 ppm organic vapors slight gasoline-like odor
20			7, 15, 17				saturated, some dark brown ▽ nodules Samples collected with 2" dia brass tubes Collected tubes were covered with teflon wrap, capped with PVC caps, taped and labeled
			8, 13, 19				SANDY SILT (ML), moist, light brown, some orange-brown, very fine grained sand, trace 1/2-1" diameter gravels, no gasoline-like odor (0 ppm)
							Completed as 2" dia ground water monitoring well
30			5, 5, 8				SILTY CLAY (CL), moist, brown, some light brown, silty, no gasoline-like odor (0 ppm)
							S means sample locations W means well seal log C means well casing log Information is not to be used for any engineering purposes Samples collected at specified intervals
40							

SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	94286-03
DRILL COMPANY	V&W Drilling	DATE STARTED	6-16-94
DRILL EQUIPMENT	Mobile B-61, 8" augur	DATE FINISHED	6-16-94
GEOLGIST	Steve Baker	FIRST WATER, FT	23 5 Feet
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	26 Feet

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

BORING B-10

DEPTH BGS	C	W	BLOWS PER 6"	S	OV (PPM)	LOG	DESCRIPTION
0							
							Boring backfilled with grout to ground surface
							CLAY (CL), moist, light brown, orange-brown, slightly silty, some dark brown hard nodules, no gasoline-like odor
			6, 6, 7				0 6 ppm organic vapors
10			5, 6, 7				3 2 ppm organic vapors
			7, 19, 30				10 ppm organic vapors
							SANDY CLAY (CL), moist to very moist, grey, Fine to medium grained sand, trace of 1" diameter gravel, no gasoline-like odor
20			4, 5, 7				0 4 ppm organic vapors silty some orange-brown nodules
							CLAY (CL), very moist, grey-brown, sticky, trace sand, no gasoline-like odor
			3, 5, 7				0 2 ppm organic vapors
							Samples collected with a 2" dia brass tubes
							Collection tubes were covered
30							with teflon wrap, capped with PVC caps, taped and labeled
							S means sample locations
							W means well seal log
							C means well casing log
							Information is not to be used for any engineering purposes
							Samples collected at specified intervals
40							

SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	94286-03
DRILL COMPANY	V&W Drilling	DATE STARTED	6-16-94
DRILL EQUIPMENT	Mobile B-61, 8" augur	DATE FINISHED	6-16-94
GEOLGIST	Steve Baker	FIRST WATER, FT	23 feet
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	26 feet

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

BORING B-11

DEPTH BGS	C	W	BLOWS PER 6"	S	OV (PPM)	LOG	DESCRIPTION
0							FILL, black, asphalt-like material
			3, 12, 16				SILTY SAND (SM), moist, very fine grained, silt, some gravel 1/8-1" diameter, angular, root-like zones, orange-brown areas, very strong septic-like odor, no gasoline-like odor
10			3, 5, 10				CLAY (CL), moist, light brown, orange-brown, cracks in sample are very moist, slightly silty, no gasoline-like odor
			5, 8, 10				
20			6, 8, 12				SILT (ML), moist, brown, orange-brown, trace pebbles 1/16" diameter no gasoline-like odor
			5, 6, 10				SILTY CLAY (CL), moist to saturated, grey, some orange-brown spots, silty, no gasoline-like odor
30							
40							

Samples collected with 2" dia brass tubes ▽

Collected tubes were covered with teflon wrap, capped with PVC caps, taped and labeled

Boring backfilled with grout to ground surface

S means sample locations

W means well seal log

C means well casing log

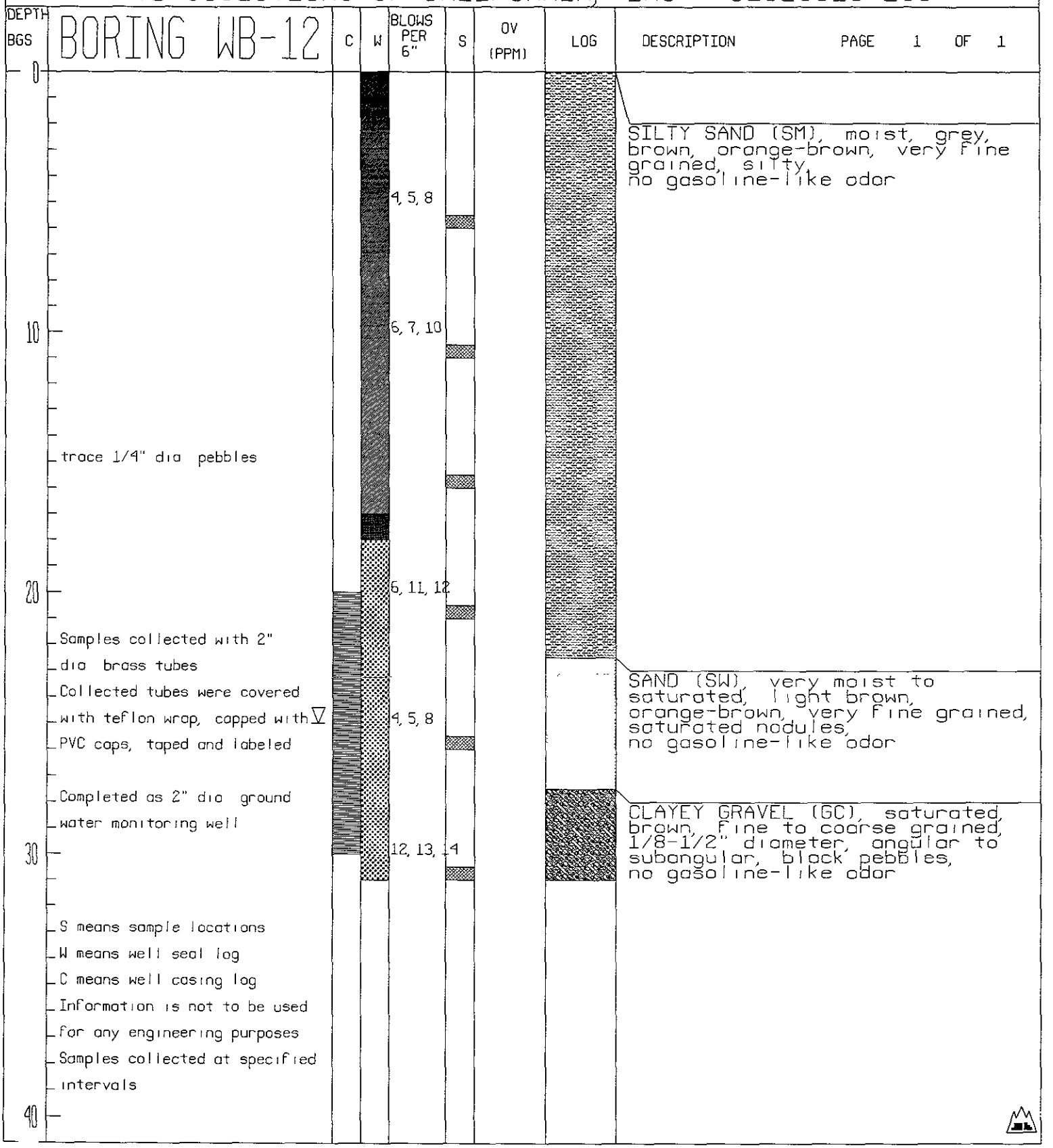
Information is not to be used for any engineering purposes

Samples collected at specified intervals

SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	94286-03
DRILL COMPANY	V&W Drilling	DATE STARTED	6-16-94
DRILL EQUIPMENT	Mobile B-61, 8" augur	DATE FINISHED	6-16-94
GEOLGIST	Steve Baker	FIRST WATER, FT	25 feet
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	31 feet

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

BORING WB-12



SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	94286-03
DRILL COMPANY	V&W Drilling	DATE STARTED	6-17-94
DRILL EQUIPMENT	Mobile B-61, 8" augur	DATE FINISHED	6-17-94
GEOLGIST	Steve Baker	FIRST WATER, FT	25 feet
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	26 feet

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

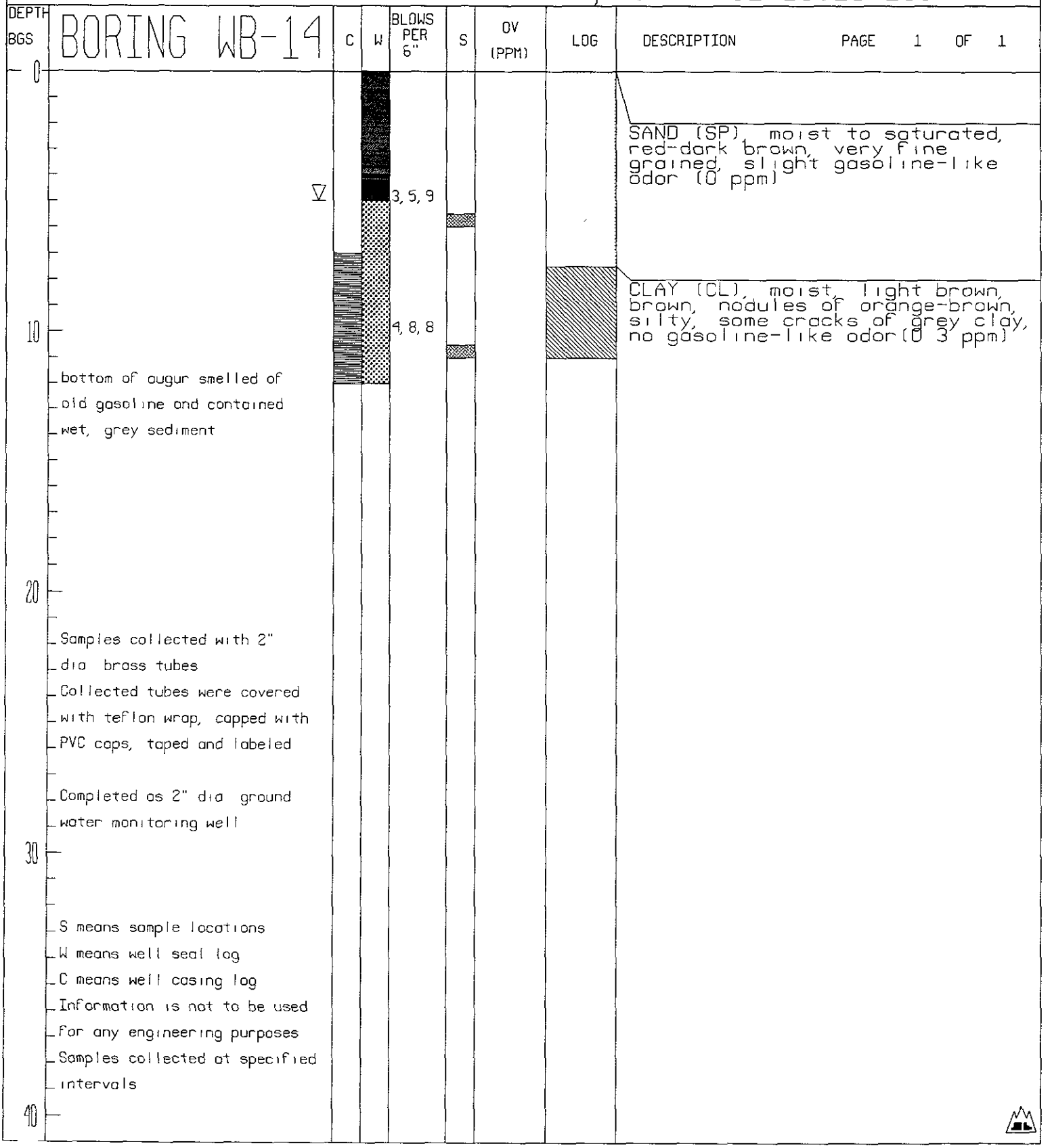
BORING B-13

DEPTH BGS	C	W	BLOWS PER 6"	S	OV (PPM)	LOG	DESCRIPTION
0							FILL, black, asphalt-like
			5, 10, 18				CLAYEY SILT (ML), moist, brown, some orange-brown, clayey, no gasoline-like odor
10			4, 5, 7				slight very fine grained sand
			18, 10, 13				SANDY SILT (SP), moist, brown, orange-brown, silty, very fine grained sand, no gasoline-like odor
20			12, 18, 22				some black nodules
							Samples collected with 2" dia brass tubes
			4, 6, 9				saturated, no black nodules ▽
							Collected tubes were covered with teflon wrap, capped with
30							PVC caps, taped and labeled
							Boring backfilled with grout to ground surface
							S means sample locations
							W means well seal log
							C means well casing log
							Information is not to be used for any engineering purposes
							Samples collected at specified intervals
40							

SITE LOCATION	4800 San Pablo Avenue, Emeryville, California	PROJECT NO	94286-03
DRILL COMPANY	V&W Drilling	DATE STARTED	6-16-94
DRILL EQUIPMENT	Mobile B-61, 8" augur	DATE FINISHED	6-16-94
GEOLGIST	Steve Baker	FIRST WATER, FT	5 Feet
ORGANIC VAPOR(OV) DEVICE USED	Hnu Meter	TOTAL DEPTH, FT	11 Feet

HYDROSOLUTIONS OF CALIFORNIA, INC - GEOLOGIC LOG

BORING WB-14



Appendix B. Sediment Chemical Analysis

MATRIX
ENVIRONMENTAL LABORATORIES INC.

Hydro Solutions
5917 Moss Creek Circle
Suite No.2
Fair Oaks, Ca 95628-2714

6/27/94

ATTN: Steven Baker

Re: Project: **94286**
Lab Reference Number: **4515**
Date Samples Received: **6/17/94**
No. Samples Received: **40**

The samples were received by Matrix Environmental Laboratories intact and in good condition. Samples conformed to required sampling protocols for the requested analyses and were accompanied by required documentation.

Please call if we can be of further assistance.

Sincerely,

Charles R. Todd,
Laboratory Director

3017 KILGORE ROAD #100 • RANCHO CORDOVA, CA 95742 PHONE (916) 635-3992 • FAX (916) 635-0314

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: N/A
Lab ID: Method Blank

Date Sampled: N/A
Date Received: N/A
Date Extracted: 6/20/94
Date of Analysis: 6/20/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	ND	0.005
ETHYLBENZENE	ND	0.005
XYLENES	ND	0.015
SURROGATE RECOVERY	95%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: WB - 9 - 15
Lab ID: 941911

Date Sampled: 6/16/94
Date Received: 6/17/94
Date Extracted: 6/20/94
Date of Analysis: 6/20/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	0.015	0.005
TOLUENE	0.007	0.005
ETHYLBENZENE	0.084	0.005
XYLENES	0.12	0.015
SURROGATE RECOVERY	85%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: WB - 9 - 20
Lab ID: 941912

Date Sampled: 6/16/94
Date Received: 6/17/94
Date Extracted: 6/20/94
Date of Analysis: 6/20/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	ND	0.005
ETHYLBENZENE	ND	0.005
XYLENES	ND	0.015
SURROGATE RECOVERY	87%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: WB - 12 - 10
Lab ID: 941916

Date Sampled: 6/16/94
Date Received: 6/17/94
Date Extracted: 6/20/94
Date of Analysis: 6/20/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	ND	0.005
ETHYLBENZENE	ND	0.005
XYLENES	ND	0.015
SURROGATE RECOVERY	89%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: WB - 12 - 20
Lab ID: 941918

Date Sampled: 6/16/94
Date Received: 6/17/94
Date Extracted: 6/20/94
Date of Analysis: 6/20/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	ND	0.005
ETHYLBENZENE	ND	0.005
XYLENES	ND	0.015
SURROGATE RECOVERY	88%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: B - 11 - 10
Lab ID: 941924

Date Sampled: 6/16/94
Date Received: 6/17/94
Date Extracted: 6/20/94
Date of Analysis: 6/20/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	ND	0.005
ETHYLBENZENE	ND	0.005
XYLENES	ND	0.015
SURROGATE RECOVERY	86%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: B - 11 - 20
Lab ID: 941926

Date Sampled: 6/16/94
Date Received: 6/17/94
Date Extracted: 6/20/94
Date of Analysis: 6/20/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	ND	0.005
ETHYLBENZENE	ND	0.005
XYLENES	ND	0.015
SURROGATE RECOVERY	87%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: WB - 7 - 10
Lab ID: 941929

Date Sampled: 6/16/94
Date Received: 6/17/94
Date Extracted: 6/20/94
Date of Analysis: 6/20/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	ND	0.005
ETHYLBENZENE	ND	0.005
XYLENES	ND	0.015
SURROGATE RECOVERY	85%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: WB - 7 - 20
Lab ID: 941931

Date Sampled: 6/16/94
Date Received: 6/17/94
Date Extracted: 6/20/94
Date of Analysis: 6/20/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	ND	0.005
ETHYLBENZENE	ND	0.005
XYLENES	ND	0.015
SURROGATE RECOVERY	84%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: B - 10 - 10
Lab ID: 941935

Date Sampled: 6/16/94
Date Received: 6/17/94
Date Extracted: 6/20/94
Date of Analysis: 6/20/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	0.007	0.005
ETHYLBENZENE	0.008	0.005
XYLENES	0.017	0.015
SURROGATE RECOVERY	85%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: B - 10 - 20
Lab ID: 941937

Date Sampled: 6/16/94
Date Received: 6/17/94
Date Extracted: 6/20/94
Date of Analysis: 6/20/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	ND	0.005
ETHYLBENZENE	ND	0.005
XYLENES	ND	0.015
SURROGATE RECOVERY	86%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: B - 13 - 10
Lab ID: 941940

Date Sampled: 6/17/94
Date Received: 6/17/94
Date Extracted: 6/21/94
Date of Analysis: 6/21/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	ND	0.005
ETHYLBENZENE	ND	0.005
XYLENES	ND	0.015
SURROGATE RECOVERY	85%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: B - 13 - 20
Lab ID: 941942

Date Sampled: 6/17/94
Date Received: 6/17/94
Date Extracted: 6/21/94
Date of Analysis: 6/21/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	ND	0.005
ETHYLBENZENE	ND	0.005
XYLENES	ND	0.015
SURROGATE RECOVERY	84%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: WB - 8 - 15
Lab ID: 941945

Date Sampled: 6/17/94
Date Received: 6/17/94
Date Extracted: 6/21/94
Date of Analysis: 6/21/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	ND	0.005
ETHYLBENZENE	ND	0.005
XYLENES	ND	0.015
SURROGATE RECOVERY	85%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 8020

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Sample ID: WB - 8 - 20
Lab ID: 941946

Date Sampled: 6/17/94
Date Received: 6/17/94
Date Extracted: 6/21/94
Date of Analysis: 6/21/94
Matrix: SOIL

COMPOUND	mg/kg (ppm)	REPORTING LIMIT (ppm)
BENZENE	ND	0.005
TOLUENE	ND	0.005
ETHYLBENZENE	ND	0.005
XYLENES	ND	0.015
SURROGATE RECOVERY	87%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX SPIKE SUMMARY

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4515**
Project No: **# 94286**
Sample ID: **N/A**
Lab ID: **LCS/LCSD**

Date Sampled: **N/A**
Date Received: **N/A**
Date Extracted: **6/20/94**
Date of Analysis: **6/20/94**
Matrix: **SOIL**

COMPOUND	CONC SPIKED mg/kg (ppm)	CONC MEASURED		PERCENT RECOVERY		
		LCS	LCSD	LCS	LCSD	RPD
BENZENE	0.588	0.670	0.665	114%	113%	1%
TOLUENE	0.896	1.011	0.987	113%	110%	2%
ETHYLBENZENE	0.690	0.743	0.718	108%	104%	3%
TOTAL XYLENES	1.76	1.83	1.78	104%	101%	3%

LCS= LABORATORY CONTROL SPIKE
LCSD= LABORATORY CONTROL SPIKE DUPLICATE
RPD= RELATIVE PERCENT DIFFERENCE
CONC= CONCENTRATION

MATRIX ENVIRONMENTAL LABORATORIES

3017 KILGORE ROAD #100 RANCHO CORDOVA, CA 95742 PHONE (916) 635-3962 FAX (916) 635-9331

ANALYSIS: TPH-GASOLINE by EPA 5030 PURGE-AND-TRAP

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: # 94286
Matrix: SOIL

Date Sampled: 6/16/94
Date Received: 6/17/94
Date Extracted: 6/20/94
Date of Analysis: 6/20/94

Sample ID	Lab ID	GASOLINE mg/kg (ppm)	REPORTING LIMIT mg/kg (ppm)	SURROGATE RECOVERY
WB - 9 - 15	941911	2.5	1.0	87%
WB - 9 - 20	941912	ND	1.0	89%
WB - 12 - 10	941916	ND	1.0	96%
WB - 12 - 20	941918	ND	1.0	94%
B - 11 - 10	941924	ND	1.0	91%
B - 11 - 20	941926	ND	1.0	92%
WB - 7 - 10	941929	ND	1.0	88%
WB - 7 - 20	941931	ND	1.0	86%
B - 10 - 10	941935	1.5	1.0	89%
B - 10 - 20	941937	ND	1.0	89%
N/A	Method Blank	ND	1.0	106%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

017 KILGORE ROAD #100 RANCHO CORDOVA, CA 95742 *PHONE (916) 635-3962 FAX (916) 635-9331*

ANALYSIS: TPH-GASOLINE by EPA 5030 PURGE-AND-TRAP

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4515**
Project No: **# 94286**
Matrix: **SOIL**

Date Sampled: **6/17/94**
Date Received: **6/17/94**
Date Extracted: **6/21/94**
Date of Analysis: **6/21/94**

Sample ID	Lab ID	GASOLINE mg/kg (ppm)	REPORTING LIMIT mg/kg (ppm)	SURROGATE RECOVERY
B - 13 - 10	**941940**	ND	1.0	105%
B - 13 - 20	**941942**	ND	1.0	105%
WB - 8 - 15	**941945**	ND	1.0	106%
WB - 8 - 20	**941946**	ND	1.0	108%
N/A	**Method Blank**	ND	1 0	101%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

3017 KILGORE ROAD #100 RANCHO CORDOVA, CA 95742 *PHONE (916) 635-3962 FAX (916) 635-9331*

ANALYSIS: TPH-GASOLINE SPIKE SUMMARY

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4515**
Project No: **# 94286**
Sample ID: **N/A**
Lab ID: **LCS/LCSD**

Date Sampled: **N/A**
Date Received: **N/A**
Date Extracted: **6/20/94**
Date of Analysis: **6/20/94**
Matrix: **SOIL**

COMPOUND	CONC SPIKED mg/kg (ppm)	CONC MEASURED		PERCENT RECOVERY		
		LCS	LCSD	LCS	LCSD	RPD
GASOLINE	4.55	5.20	5.08	114%	112%	2%

LCS= LABORATORY CONTROL SPIKE
LCSD= LABORATORY CONTROL SPIKE DUPLICATE
RPD= RELATIVE PERCENT DIFFERENCE
CONC= CONCENTRATION

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: EPA 418.1, OIL & GREASE by IR SPECTROPHOTOMETER

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4515**
Project No: **94286**
Sample ID: **N/A**
Lab ID: **METHOD BLANK**

Date Sampled: **N/A**
Date Received: **N/A**
Date Extracted: **6/24/94**
Date of Analysis: **6/24/94**
Matrix: **SOIL**

COMPOUND	(mg/Kg) (ppm)	REPORTING LIMIT (ppm)
OIL & GREASE	ND	50

NOTE: (ND) NOT DETECTED AT OR ABOVE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: EPA 418.1, OIL & GREASE by IR SPECTROPHOTOMETER

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4515**
Project No: **94286**
Sample ID: **WB-9-15**
Lab ID: **941911**

Date Sampled: **6/16/94**
Date Received: **6/16/94**
Date Extracted: **6/24/94**
Date of Analysis: **6/24/94**
Matrix: **SOIL**

COMPOUND	(mg/Kg) (ppm)	REPORTING LIMIT (ppm)
OIL & GREASE	ND	50

NOTE: (ND) NOT DETECTED AT OR ABOVE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: EPA 418.1, OIL & GREASE by IR SPECTROPHOTOMETER

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4515**
Project No: **94286**
Sample ID: **WB-9-20**
Lab ID: **941912**

Date Sampled: **6/16/94**
Date Received: **6/16/94**
Date Extracted: **6/24/94**
Date of Analysis: **6/24/94**
Matrix: **SOIL**

COMPOUND	(mg/Kg) (ppm)	REPORTING LIMIT (ppm)
OIL & GREASE	ND	50

NOTE: (ND) NOT DETECTED AT OR ABOVE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: EPA 418.1, OIL & GREASE by IR SPECTROPHOTOMETER

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4515**
Project No: **94286**
Sample ID: **WB-12-10**
Lab ID: **941916**

Date Sampled: **6/16/94**
Date Received: **6/16/94**
Date Extracted: **6/24/94**
Date of Analysis: **6/24/94**
Matrix: **SOIL**

COMPOUND	(mg/Kg) (ppm)	REPORTING LIMIT (ppm)
OIL & GREASE	ND	50

NOTE: (ND) NOT DETECTED AT OR ABOVE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: EPA 418.1, OIL & GREASE by IR SPECTROPHOTOMETER

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4515**
Project No: **94286**
Sample ID: **WB-12-20**
Lab ID: **941918**

Date Sampled: **6/16/94**
Date Received: **6/16/94**
Date Extracted: **6/24/94**
Date of Analysis: **6/24/94**
Matrix: **SOIL**

COMPOUND	(mg/Kg) (ppm)	REPORTING LIMIT (ppm)
OIL & GREASE	ND	50

NOTE: (ND) NOT DETECTED AT OR ABOVE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: EPA 418.1, OIL & GREASE by IR SPECTROPHOTOMETER

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4515
Project No: 94286
Sample ID: WB-8-15
Lab ID: 941945

Date Sampled: 6/16/94
Date Received: 6/16/94
Date Extracted: 6/24/94
Date of Analysis: 6/24/94
Matrix: SOIL

COMPOUND	(mg/Kg) (ppm)	REPORTING LIMIT (ppm)
OIL & GREASE	ND	50

NOTE: (ND) NOT DETECTED AT OR ABOVE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: EPA 418.1, OIL & GREASE by IR SPECTROPHOTOMETER

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4515**
Project No: **94286**
Sample ID: **WB-8-20**
Lab ID: **941946**

Date Sampled: **6/16/94**
Date Received: **6/16/94**
Date Extracted: **6/24/94**
Date of Analysis: **6/24/94**
Matrix: **SOIL**

COMPOUND	(mg/Kg) (ppm)	REPORTING LIMIT (ppm)
OIL & GREASE	ND	50

NOTE: (ND) NOT DETECTED AT OR ABOVE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: EPA 418.1; OIL & GREASE SPIKE SUMMARY

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4515**
Project No: **94286**
Sample ID: **N/A**
Lab ID: **LCS/LCSD**

Date Sampled: **N/A**
Date Received: **N/A**
Date Extracted: **6/24/94**
Date of Analysis: **6/24/94**
Matrix: **SOIL**

COMPOUND	CONC SPIKED	CONC MEASURED		PERCENT RECOVERY		
		LCS	LCSD	LCS	LCSD	RPD
OIL & GREASE	500	451	471	90%	94%	4%

LCS= LABORATORY CONTROL SPIKE
LCSD= LABORATORY CONTROL SPIKE DUPLICATE
RPD= RELATIVE PERCENT DIFFERENCE
CONC= CONCENTRATION

HydroSolutions of California
5917 Moss Creek Circle
Fair Oaks, CA 95628

07/22/94

Attention: Steve Baker

Reference: Analytical Results

Project Name:
Project No.: 94286
Date Received: 06/17/94
Chain Of Custody: NO NUMBER

CLS ID No.: M5321
CLS Job No.: 795321

The following analyses were performed on the above referenced project:

No. of Samples	*Turnaround Time*	*Analysis Description*
1	10 Days	Total Recoverable Petroleum Hydrocarbons
1	10 Days	TPH Volatiles by DHS Method - EPA M8015

These samples were received by California Laboratory Services in a chilled, intact state and accompanied by a valid chain of custody document.

The TPH Volatile analysis was performed on a TCLP zero headspace extract.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

George Hampton
Laboratory Director

Analysis Report: **Total Recoverable Petroleum Hydrocarbons, EPA Method 418.1 Shaker, DOHS LUFT Method**

Client: **HydroSolutions of California**
5917 Moss Creek Circle
Fair Oaks, CA 95628

Project:

Date Sampled: 06/17/94
Date Received: 06/17/94
Date Extracted: 06/27/94
Date Analyzed: 06/27/94
Date Reported: 06/29/94
Client ID No.: WB-8-10

Project No.: 94286
Contact: Steve Baker
Phone: (916)967-1222

CLS Contact: George Hampton
Job No.: 795321
COC Log No.: NO NUMBER
CLS ID No.: M5321-1A
Batch No.: 13927
Matrix: SOIL

Sample: WB-8-10

Analyte	CAS No.	Results (mg/kg)	Rep. Limit (mg/kg)	Dilution
Total Recoverable Hydrocarbons	N/A	24	10	1.0

ND = Not detected at or above indicated Reporting Limit
Rep. Limit = Reporting Limit

Analysis Report: Total Recoverable Petroleum Hydrocarbons, EPA Method 418.1
Shaker, DOHS LUFT Method

Client: HydroSolutions of California
5917 Moss Creek Circle
Fair Oaks, CA 95628

Project:

Date Extracted: 06/27/94
Date Analyzed: 06/27/94
Date Reported: 06/29/94

Project No.: 94286
Contact: Steve Baker
Phone: (916)967-1222

CLS Contact: George Hampton
Job No.: 795321
COC Log No.: NO NUMBER
CLS ID No.: M5321
Batch No.: 13927
Matrix: SOIL

METHOD BLANK

Analyte	CAS No.	Results (mg/kg)	Rep. Limit (mg/kg)
Total Recoverable Hydrocarbons	N/A	ND	10

ND = Not detected at or above indicated Reporting Limit
Rep. Limit = Reporting Limit

California Laboratory Services

Analysis Report: **Total Recoverable Petroleum Hydrocarbons, EPA Method 418.1 Shaker, DOHS LUFT Method**

Client: HydroSolutions of California
5917 Moss Creek Circle
Fair Oaks, CA 95628

Project:

Date Extracted: 06/27/94
Date Analyzed: 06/27/94
Date Reported: 06/29/94

Project No.: 94286
Contact: Steve Baker
Phone: (916)967-1222

CLS Contact: George Hampton
Job No.: 795321
COC Log No.: NO NUMBER
CLS ID No.: M5321
Batch No.: 13927
Matrix: SOIL

MATRIX SPIKE

Analyte	CAS No.	MS Conc. (mg/kg)	MS Recovery (percent)
Total Recoverable Hydrocarbons	N/A	60	93

MATRIX SPIKE DUPLICATE

Analyte	CAS No.	MSD Conc. (mg/kg)	MSD Recovery (percent)
Total Recoverable Hydrocarbons	N/A	60	95

RELATIVE % DIFFERENCE

Analyte	CAS No.	Relative Percent Difference (percent)
Total Recoverable Hydrocarbons	N/A	2

California Laboratory Services

Analysis Report: Total Recoverable Petroleum Hydrocarbons, EPA Method 418.1
Shaker, DOHS LUFT Method

Client: HydroSolutions of California
5917 Moss Creek Circle
Fair Oaks, CA 95628

Project:

Date Extracted: 06/27/94
Date Analyzed: 06/27/94
Date Reported: 06/29/94

Project No.: 94286
Contact: Steve Baker
Phone: (916)967-1222

CLS Contact: George Hampton
Job No.: 795321
COC Log No.: NO NUMBER
CLS ID No.: M5321
Batch No.: 13927
Matrix: SOIL

LAB CONTROL SAMPLE

Analyte	CAS No.	LCS Conc. (mg/kg)	LCS Recovery (percent)
Total Recoverable Hydrocarbons	N/A	60	91

Analysis Report: Total Petroleum Hydrocarbons, EPA Method 8015
Purge and Trap, EPA Method 5030

Client: HydroSolutions of California
5917 Moss Creek Circle
Fair Oaks, CA 95628

Project:

Date Sampled: 06/17/94
Date Received: 06/17/94
Date Extracted: 06/22/94
Date Analyzed: 06/22/94
Date Reported: 06/27/94
Client ID No.: WB-8-10

Project No.: 94286
Contact: Steve Baker
Phone: (916)967-1222

CLS Contact: George Hampton
Job No.: 795321
COC Log No.: NO NUMBER
CLS ID No.: M5321-1B
Batch No.: 13906
Matrix: TCLEACHATE

Sample: WB-8-10

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution
TPH as Gasoline	N/A	0.96	0.050	1.0

ND = Not detected at or above indicated Reporting Limit
Rep. Limit = Reporting Limit

Analysis Report: Total Petroleum Hydrocarbons, EPA Method 8015
Purge and Trap, EPA Method 5030

Client: HydroSolutions of California
5917 Moss Creek Circle
Fair Oaks, CA 95628

Project:

Date Extracted: 06/22/94
Date Analyzed: 06/22/94
Date Reported: 06/27/94

Project No.: 94286
Contact: Steve Baker
Phone: (916)967-1222

CLS Contact: George Hampton
Job No.: 795321
COC Log No.: NO NUMBER
CLS ID No.: M5321
Batch No.: 13906
Matrix: TCLEACHATE

METHOD BLANK

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)
TPH as Gasoline	N/A	ND	0.050

ND = Not detected at or above indicated Reporting Limit
Rep. Limit = Reporting Limit

Analysis Report: Total Petroleum Hydrocarbons, EPA Method 8015
Purge and Trap, EPA Method 5030

Client: HydroSolutions of California
5917 Moss Creek Circle
Fair Oaks, CA 95628

Project:

Date Extracted: 06/22/94
Date Analyzed: 06/22/94
Date Reported: 06/27/94

Project No.: 94286
Contact: Steve Baker
Phone: (916)967-1222

CLS Contact: George Hampton
Job No.: 795321
COC Log No.: NO NUMBER
CLS ID No.: M5321
Batch No.: 13906
Matrix: TCLEACHATE

MATRIX SPIKE

Analyte	CAS No.	MS Conc. (mg/L)	MS Recovery (percent)
Gasoline	N/A	2.5	88

MATRIX SPIKE DUPLICATE

Analyte	CAS No.	MSD Conc. (mg/L)	MSD Recovery (percent)
Gasoline	N/A	2.5	92

RELATIVE % DIFFERENCE

Analyte	CAS No.	Relative Percent Difference (percent)
Gasoline	N/A	4

Analysis Report: **Total Petroleum Hydrocarbons, EPA Method 8015**
Purge and Trap, EPA Method 5030

Client: **HydroSolutions of California**
5917 Moss Creek Circle
Fair Oaks, CA 95628

Project:

Date Extracted: 06/22/94
Date Analyzed: 06/22/94
Date Reported: 06/27/94

Project No.: 94286
Contact: Steve Baker
Phone: (916)967-1222

CLS Contact: George Hampton
Job No.: 795321
COC Log No.: NO NUMBER
CLS ID No.: M5321
Batch No.: 13906
Matrix: TCLEACHATE

LAB CONTROL SAMPLE

Analyte	CAS No.	LCS Conc. (mg/L)	LCS Recovery (percent)
Gasoline	N/A	2.5	104

Appendix C. Ground Water Chemical Analysis

MATRIX
ENVIRONMENTAL LABORATORIES INC.

Hydro Solutions
5917 Moss Creek Circle
Suite No.2
Fair Oaks, Ca 95628-2714

7/1/94

ATTN: Steven Baker

Re: Project: **94286**
Lab Reference Number: **4518**
Date Samples Received: **6/20/94**
No. Samples Received: **15**

The samples were received by Matrix Environmental Laboratories intact and in good condition. Samples conformed to required sampling protocols for the requested analyses and were accompanied by required documentation.

Please call if we can be of further assistance.

Sincerely,

Charles R. Todd, for
Laboratory Director

3017 KILGORE ROAD #100 • PANCHO CORDOVA, CA 95742 PHONE (916) 635-3962 • FAX (916) 635-9331

MATRIX ENVIRONMENTAL LABORATORIES

3017 KILGORE ROAD #100 RANCHO CORDOVA, CA 95742 *PHONE (916) 635-3962 FAX (916) 635-9331*

ANALYSIS: SM 5520, OIL & GREASE

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4518**
Project No: **94286**
Matrix: **WATER**

Date Sampled: **6/20/94**
Date Received: **6/20/94**
Date Extracted: **6/27/94**
Date of Analysis: **6/30/94**

Lab ID	Sample ID	Oil & Grease mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
941965	W B - 7	ND	1.0
941968	W B - 8	ND	1.0
941971	W B - 9	ND	1.0
941974	W B - 12	1.7	1.0
941977	W B - 14	1.1	1.0
Method Blank	N/A	ND	1.0

NOTE: (ND) =NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: OIL & GREASE SPIKE SUMMARY

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4518**
Project No: **94286**
Sample ID: **N/A**
Lab ID: **LCS/LCSD**

Date Sampled: **N/A**
Date Received: **N/A**
Date Extracted: **6/27/94**
Date of Analysis: **6/30/94**
Matrix: **WATER**

COMPOUND	CONC SPIKED	CONC MEASURED		PERCENT RECOVERY		
		LCS	LCSD	LCS	LCSD	RPD
OIL & GREASE	10	9.6	10.2	96%	102%	6%

LCS= LABORATORY CONTROL SPIKE
LCSD= LABORATORY CONTROL SPIKE DUPLICATE
RPD= RELATIVE PERCENT DIFFERENCE
CONC= CONCENTRATION

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 602

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4518**
Project No: **# 94286**
Sample ID: **N/A**
Lab ID: **Method Blank**

Date Sampled: **N/A**
Date Received: **N/A**
Date Extracted: **N/A**
Date of Analysis: **6/23/94**
Matrix: **WATER**

COMPOUND	ug/L (ppb)	REPORTING LIMIT (ppb)
BENZENE	ND	0.3
TOLUENE	ND	0.3
ETHYLBENZENE	ND	0.3
XYLENES	ND	0.9
SURROGATE RECOVERY	104%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 602

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4518**
Project No: **# 94286**
Sample ID: **W B - 7**
Lab ID: **941963**

Date Sampled: **6/20/94**
Date Received: **6/20/94**
Date Extracted: **N/A**
Date of Analysis: **6/23/94**
Matrix: **WATER**

COMPOUND	ug/L (ppb)	REPORTING LIMIT (ppb)
BENZENE	ND	0.3
TOLUENE	ND	0.3
ETHYLBENZENE	ND	0.3
TOTAL XYLENES	ND	0.9
SURROGATE RECOVERY	101%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 602

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4518**
Project No: **# 94286**
Sample ID: **W B - 8**
Lab ID: **941966**

Date Sampled: **6/20/94**
Date Received: **6/20/94**
Date Extracted: **N/A**
Date of Analysis: **6/23/94**
Matrix: **WATER**

COMPOUND	ug/L (ppb)	REPORTING LIMIT (ppb)
BENZENE	3.0	0.3
TOLUENE	1.0	0.3
ETHYLBENZENE	0.6	0.3
TOTAL XYLENES	ND	0.9
SURROGATE RECOVERY	102%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 602

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4518
Project No: # 94286
Sample ID: W B - 9
Lab ID: 941969

Date Sampled: 6/20/94
Date Received: 6/20/94
Date Extracted: N/A
Date of Analysis: 6/23/94
Matrix: WATER

COMPOUND	ug/L (ppb)	REPORTING LIMIT (ppb)
BENZENE	2.8	0.3
TOLUENE	1.3	0.3
ETHYLBENZENE	ND	0.3
TOTAL XYLENES	ND	0.9
SURROGATE RECOVERY	110%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 602

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4518**
Project No: **# 94286**
Sample ID: **W B - 12**
Lab ID: **941972**

Date Sampled: **6/20/94**
Date Received: **6/20/94**
Date Extracted: **N/A**
Date of Analysis: **6/23/94**
Matrix: **WATER**

COMPOUND	ug/L (ppb)	REPORTING LIMIT (ppb)
BENZENE	ND	0.3
TOLUENE	ND	0.3
ETHYLBENZENE	ND	0.3
TOTAL XYLENES	ND	0.9
SURROGATE RECOVERY	110%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX, EPA 602

CLIENT: Hydro Solutions
CONTACT: S. Baker
COC No: 4518
Project No: # 94286
Sample ID: W B - 14
Lab ID: 941975

Date Sampled: 6/20/94
Date Received: 6/20/94
Date Extracted: N/A
Date of Analysis: 6/23/94
Matrix: WATER

COMPOUND	ug/L (ppb)	REPORTING LIMIT (ppb)
BENZENE	65	3
TOLUENE	3.2	3
ETHYLBENZENE	ND	3
TOTAL XYLENES	10	9
SURROGATE RECOVERY	103%	ACCEPTABLE RANGE 70% TO 130%

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

This sample was diluted to a 1: 10 ratio and the reporting limits adjusted accordingly.

MATRIX ENVIRONMENTAL LABORATORIES

ANALYSIS: BTEX SPIKE SUMMARY

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4518**
Project No: **# 94286**
Sample ID: **N/A**
Lab ID: **MS/MSD**

Date Sampled: **N/A**
Date Received: **N/A**
Date Extracted: **N/A**
Date of Analysis: **6/23/94**
Matrix: **WATER**

COMPOUND	CONC SPIKED ug/L (ppb)	CONC MEASURED		PERCENT RECOVERY		
		MS	MSD	MS	MSD	RPD
BENZENE	11.76	12.61	11.72	107%	100%	7%
TOLUENE	17.92	19.25	18.36	107%	102%	5%
ETHYLBENZENE	13.80	14.17	13.52	103%	98%	5%
TOTAL XYLENES	35.28	35.11	33.55	100%	95%	5%

MS= LABORATORY CONTROL SPIKE
MSD= LABORATORY CONTROL SPIKE DUPLICATE
RPD= RELATIVE PERCENT DIFFERENCE
CONC= CONCENTRATION

MATRIX ENVIRONMENTAL LABORATORIES

3017 KILGORE ROAD #100 RANCHO CORDOVA, CA 95742 *PHONE (916) 635-3962 FAX (916) 635-9331*

ANALYSIS: TPH-GASOLINE by EPA 5030 PURGE-AND-TRAP

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4518**
Project No: **# 94286**
Matrix: **WATER**

Date Sampled: **6/20/94**
Date Received: **6/20/94**
Date Extracted: **N/A**
Date of Analysis: **6/23/94**

Sample ID	Lab ID		GASOLINE ug/L (ppb)	REPORTING LIMIT ug/L (ppb)	SURROGATE RECOVERY
W B - 7	**941963**		ND	50	100%
W B - 8	**941966**		230	50	97%
W B - 9	**941969**		270	50	105%
W B - 12	**941972**		ND	50	111%
W B - 14	**941975**	* *	1,900	500	102%
N/A	**Method Blank**		ND	50	104%

* * This sample was analyzed at 1: 10 dilution and the reporting limit adjusted accordingly.

NOTE: (ND) NOT DETECTED AT OR ABOVE THE REPORTING LIMITS.

MATRIX ENVIRONMENTAL LABORATORIES

3017 KILGORE ROAD #100 RANCHO CORDOVA, CA 95742 *PHONE (916) 635-3962 FAX (916) 635-9331*

ANALYSIS: TPH-GASOLINE SPIKE SUMMARY

CLIENT: **Hydro Solutions**
CONTACT: **S. Baker**
COC No: **4518**
Project No: **# 94286**
Sample ID: **N/A**
Lab ID: **MS/MSD**

Date Sampled: **N/A**
Date Received: **N/A**
Date Extracted: **N/A**
Date of Analysis: **6/23/94**
Matrix: **WATER**

COMPOUND	CONC SPIKED ug/L (ppb)	CONC MEASURED		PERCENT RECOVERY		
		MS	MSD	MS	MSD	RPD
GASOLINE	91.0	94.4	88.6	104%	97%	6%

MS= MATRIX SPIKE
MSD= MATRIX SPIKE DUPLICATE
RPD= RELATIVE PERCENT DIFFERENCE
CONC= CONCENTRATION

Anlab
ANALYTICAL LABORATORY
1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

July 5, 1994

Hydrosolutions of California
5917 Moss Creek Circle, Ste. 2
Fair Oaks, CA 95628
Attn: Steve Baker

P.O. #: 94286
Project Name: Pablo

Anlab I.D. AD15203 — Client Code: 538
SAMPLE DESCRIPTION: WB-12 — Matrix: WW
Sample collection date: 06/20/94 — Time:
Lab submittal date: 06/20/94 — Time: 14:31
Turn-Around-Time: REG — Sample Disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Total Coliform (15T) by SM 9221	MPN/100ml	< 2	2
Fecal Coliform (15T) by SM 9221	MPN/100ml	< 2	2

Anlab I.D. AD15204 — Client Code: 538
SAMPLE DESCRIPTION: WB-14 — Matrix: WW
Sample collection date: 06/20/94 — Time:
Lab submittal date: 06/20/94 — Time: 14:31
Turn-Around-Time: REG — Sample Disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Total Coliform (15T) by SM 9221	MPN/100ml	9000	2
Fecal Coliform (15T) by SM 9221	MPN/100ml	< 2	2

Report Approved By: _____
ELAP ID #: 1468

:lki

Apendix D. Chain-of-Custody

HydroSolutions Of California, Inc.

Chain of Custody Record

PROJECT NO.: 94286

SAMPLERS: (Signature) S. BAKER

DATE	TIME	SAMPLE NUMBER	General Mineral	Priority Pollutant Metals	EPA Method 624	EPA Method 625	EPA Method 608	TPH-G	BTXE					NUMBER OF CONTAINERS	REMARKS (Sample preservation, handling procedures, etc.)
6/6		WB-9-5													
		WB-9-10													
		WB-9-15						X	X						
		WB-9-20						X	X						
		WB-9-25													
		WB-9-30													
		WB-12-5													
		WB-12-10						X	X						
		WB-12-15													
		WB-12-20						X	X						
		WB-12-25													
		WB-12-30													
		WB-14-5													
		WB-14-10													
		B-11-5													
		B-11-10						X	X						
		B-11-15													
		B-11-20						X	X						
		B-11-25													
		WB-7-5													
		WB-7-10						X	X						
		WB-7-15													
		WB-7-20						X	X						
↓		WB-7-25													

TOTAL NUMBER OF CONTAINERS

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
	6/7/94 15:45			6/7/94 1545	M Hester

METHOD OF SHIPMENT:	SHIPPED BY: (Signature)	COURIER: (Signature)	RECEIVED FOR LAB BY: (Signature)	DATE/TIME

HydroSolutions Of California, Inc.

Chain of Custody Record

PROJECT NO. 94286

SAMPLERS: (Signature) BAKER

DATE	TIME	SAMPLE NUMBER	General Mineral	Priority Pollutant Metals	EPA Method 624	EPA Method 625	EPA Method 608	TPH-G	BTXE						NUMBER OF CONTAINERS	REMARKS (Sample preservation, handling procedures, etc.)
6/16		WB-7-30													1	
		B-10-5													1	
		B-10-10						X	X						1	
		B-10-15													1	
		B-10-20						X	X						1	
		B-10-25													1	
6-17-94		B-13-5													1	
		B-13-10						X	X						1	
		B-13-15													1	
		B-13-20						X	X						1	
		B-13-25													1	
		WB-8-5													1	
		~~WB-8-10~~														dld
		WB-8-15						X	X						1	
		WB-8-20						X	X						1	
		WB-8-25													1	
		WB-8-30													1	

TOTAL NUMBER OF CONTAINERS: 16

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
	6/17/94 15:53			6/17/94 15:54	M Heston

METHOD OF SHIPMENT:	SHIPPED BY: (Signature)	COURIER: (Signature)	RECEIVED FOR LAB BY: (Signature)	DATE/TIME

HydroSolutions Of California, Inc.

Chain of Custody Record

PROJECT NO. 94286

SAMPLERS: (Signature) S. BAKER

DATE	TIME	SAMPLE NUMBER	General Mineral	Priority Pollutant Metals	EPA Method 624	EPA Method 625	EPA Method 608		TCLP					NUMBER OF CONTAINERS	REMARKS (Sample preservation, handling procedures, etc.)
6/17		WB-8-10							X					1	TCLP? for gasoline.

TOTAL NUMBER OF CONTAINERS: 1

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	6/17/94 1518				

METHOD OF SHIPMENT:	SHIPPED BY: (Signature)	COURIER: (Signature)	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
			[signature]	6/17/94 [illegible]

HydroSolutions Of California, Inc.

Chain of Custody Record

PROJECT NO. 94286

SAMPLERS: (Signature) S. BAKER

DATE	TIME	SAMPLE NUMBER	General Mineral	Priority Pollutant Metals	EPA Method 624	EPA Method 625	EPA Method 608		8015 - TPH6	8020 - BTXE	418.1			NUMBER OF CONTAINERS
6/20		WB-7							X	X	X			3
"		WB-8							X	X	X			3
"		WB-9							X	X	X			3
"		WB-12							X	X	X			3
"		WB-14							X	X	X			3

REMARKS (Sample preservation, handling procedures, etc.)

stored chilled
2 VOA's (40 ml)
1 L glass amber

2 week turnaround

TOTAL NUMBER OF CONTAINERS: 15

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
	6/20/94			6/20/94 1530	M Heyton
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